

DOCUMENT RESUME

ED 075 399

SP 006 365

TITLE Annotated Bibliography on Perceptual-Motor Development.

INSTITUTION American Association for Health, Physical Education, and Recreation, Washington, D.C.

PUB DATE 73

NOTE 122p.

AVAILABLE FROM AAPHER Publication-Sales, 1201 Sixteenth St., N.W., Washington, D.C. 20036 (Stock No. 245-25412, \$3.25 quantity discounts)

EDRS PRICE MF-\$0.65 HC Not Available from EDRS.

DESCRIPTORS *Annotated Bibliographies; Auditory Perception; *Instructional Materials; *Perceptual Development; *Perceptual Motor Coordination; *Perceptual Motor Learning; Visual Perception

ABSTRACT

This 115-page annotated bibliography contains material on perceptual motor development. The introductory portion of the bibliography presents general reading on perception, learning, and development. The first portion contains annotated works by six specific authors. The second portion presents works grouped under the following headings: a) auditory perception and movement; b) body image and movement; c) depth and distance perception and movement; d) feedback and regulation of movement behavior; e) figure-ground perception/field dependence/field independence; f) reduced and supplementary perceptual cues and movement; and g) visual and size perception movement. The final portion contains material on perceptual motor programs, categorized under tests, programs, material sources; assessment instruments; and films. Each work contains a brief description of the item and its cost. A list of publishers' addresses is also included. (BRB)

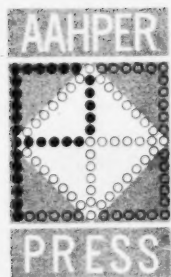
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ANNOTATED BIBLIOGRAPHY ON PERCEPTUAL-MOTOR DEVELOPMENT

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Foreword

The annotated bibliography presented herein represents one of the efforts of the Perceptual-Motor Task Force of the Physical Education Division of AAHPER, which was in operation from 1967 to 1972. It was done in cooperation with the Department of Physical Education for Women at Purdue University, Lafayette, Indiana. The selection and format are consistent with one of the guidelines of the Task Force—that the most scholarly service to education is to furnish information on scientific foundations that might enhance the understanding of perceptual-motor development.

In addition, because of a great demand for materials and information to help develop action programs, the sections on tests, programs, and material sources; assessment instruments; and films were reprinted and adapted from an AAHPER publication, *Foundations and Practices in Perceptual-Motor Learning—A Quest for Understanding* (1971).

Obviously no bibliography is ever complete. New references will be available by the time this book is published. However, the many requests for information prompted the Task Force members to assume this responsibility to the best of their ability in the absence of adequate budget and time to do a more comprehensive library research. It is a beginning and hopefully it will be helpful.

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General Reading

Alpern, Mathew; Lawrence, Merle; and Walsk, David. *Sensory Processes*. Belmont, Calif.: Brooks Cole Publishing Co., 1967.

Presents the physical and perceptual aspects of vision, hearing, smell, taste, touch, and kinesthesia using illustrations and limited technical terminology.

Birch, H. and Lefford, A. Two strategies for studying perception in "brain damaged" children. In *Brain Damage in Children, Biological and Social Aspects*, edited by H. G. Birch, pp. 46-60. Baltimore: Williams & Wilkens, 1964.

Presents two strategies which have been used to analyze perception in brain damaged children. Reports two studies comparing normal and brain damaged children and normal and cerebral palsied children.

Cohen, Leonard A. Mechanisms of perception: Their development function. In *Perceptual-Motor Foundations: A Multidisciplinary Concern*, pp. 23-48. Washington, D.C.: American Association for Health, Physical Education, and Recreation.

Explains the relationship between the physiology of the sensory systems and perception.

Cratty, Bryant. *Perceptual and Motor Development in Infants and Children*. Los Angeles: Macmillan Co., 1970.

Presents an overview of the influence of perception on fine and gross motor development. Describes the following topics in perception which may influence movement performance: perception of form and shape, perception of motion or movement, body image, and self concept. Includes a discussion and critique of these perceptual-motor training programs: Kephart, Doman-Delacato, and Getman.

Crowell, David H. Infant motor development. In *Infancy and Early Childhood*, edited by Y. Brackbill, pp. 135-203. New York: The Free Press, 1967.

Traces the relationship of early motor patterns to the asleep-awake cycle, vision, oral behavior, postural and locomotor control, prehension, dominance, and other areas of specialized motor skills. Reviews studies which include normal children up to age three.

Dembar, William. *Psychology of Perception*. New York: Holt, Rinehart & Winston, 1965.

Discusses primarily visual perception, but includes the relationship of vision to audition. Describes three-dimensional spatial organization (pp. 169-195).

Denhoff, Eric. Motor development as a function of perception. In *perceptual-Motor Foundations: A Multidisciplinary Concern*, pp. 49-68. Washington, D.C.: American Association for Health, Physical Education, and Recreation, 1969.

Reviews these theories involving a motor base for achievement: Kephart, Barsch, and Doman-Delacato. Discusses experimental research relating to these theories. Presents gross motor, fine motor, and sensory skills training programs for infants and for normal and cerebral-palsied preschool children.

Fleming, Malcolm. *Perceptual Principles in the Design of Instructional Materials*. Bloomington: Indiana University, 1970. (Education Resources Information Center, U.S. Office of Education, 400 Maryland Ave., S.W., Washington, D.C., ED 037 093, Microfiche)

Summarizes perceptual and media research for teachers who are not familiar with the technical terminology used in experimental research. Discusses the classroom application of research literature concerned with the perception of color, brightness, objects, pictures, words, size, depth, space, time, and motion.

Gibson, Eleanor. *Principles of Perceptual Learning and Development*. New York: Appleton-Century-Crofts, 1969.

Defines perceptual learning and summarizes the following traditional and contemporary theories of perceptual learning: cognitive, response-orientated, and differentiation.

Gibson, James J. *The Senses Considered as Perceptual Systems*. New York: Appleton-Century-Crofts, 1969.

Describes the environment as the source of stimulation, and the observer as actively exploring available fields of light, sound, and contact in order to extract relevant information. Discusses all the perceptual systems and the causes of deficient perception.

Glusker, Peter. A perceptual-motor learning model. *Academic Therapy Quarterly* 5 (1969): 119-127.

Describes the independence and dependence of three perceptual modes — vision, audition, and kinesthesia — by use of a model. Although the model is primarily concerned with language disabilities, it is a good example of the use of a model to describe a theory. Includes procedure for testing the model.

Gruber, J. Implications of physical education programs for children with learning disabilities. *Journal of Learning Disabilities* 2 (1969): 593-599.

Summarizes the organismic age theory of Olson, the neurological organization theory of Doman-Delacato, and the perceptual-motor theory of Kephart. Discusses the current research relating to these theories, and implications for educators. Presents problems and guidelines for future research.

Hebb, D. O. *Organization of Behavior*. New York: John Wiley & Sons, 1949.

Presents Hebb's theory of behavior and perception which is based on his assumptions about the structure of the human nervous system. Includes research supporting his theory.

Hein, Alan. Exposure history in spatial-motor development. In *Perceptual-Motor Foundations: A Multidisciplinary Concern*, pp. 69-82. Washington, D.C.: American Association for Health, Physical Education, and Recreation, 1969.

Reviews sensory enrichment and deprivation animal studies.

Hochberg, Julian. Nativism and empiricism in perception. In *Psychology in the Making*, edited by L. Postman, pp. 255-330. New York: Alfred A. Knopf, 1963.

Reviews experiments investigating the "nature-nurture" question during five historical periods, starting with the philosophers and "armchair" psychologists.

Hochberg, Julian. *Perception*. Englewood Cliffs, N.J.: Prentice-Hall, 1969.

Presents an overview of visual perception.

Howard, I. P. and Templeton, W. B. *Human Spatial Orientation*. New York: John Wiley & Sons, 1966.

Chapter two. The retina and visual direction. Explains the purposes of visual direction perception. Defines autokinetic movement and visual anisotropy in relationship to eye movement.

Chapter three. Eye movements and visual direction. Explains the relationship between eye movement and visual direction.

Chapter four. Kinaesthesia. Defines kinaesthesia as the discrimination of the positions and movement of body parts based on information other than visual, auditory, or verbal. Describes and illustrates the structure and physiology of the kinaesthetic receptors. Summarizes the research on kinaesthesia for these topics: kinaesthetic sensitivity to active and passive movements, accuracy of distance production, accuracy of movements in different directions, and accuracy of movement under different loads.

Chapter five. Structure and physiology of the labyrinths. Explains the physical structure of the vestibular canals, utricle, and labyrinthine pathways. Reviews of research on vestibular sensitivity to rotary and linear acceleration, and vestibular adaption and habituation. Defines vestibular nystagmus and oculogyral illusion.

Chapter six. Auditory localization. Explains auditory localization and experimental design and research instruments. Discusses the sensitivity of auditory localization of adults, including the effect of constant errors in auditory localization. Includes the effects of vision on auditory localization and the localization of multiple auditory signals.

Chapter seven to nine. Gravity. Orientation to gravity is discussed.

Ittelson, William H. Visual Space Perception. New York: Springer Co., 1960.

Part one. Theory of perception. Defines perception and the perceptual processes.

Part two. Visual space cues. Includes descriptions and functions of these visual cues: size, overlay, interposition, superposition, linear perspective, aerial perspective, movement parallax, light, shade, accommodation, convergence, stereoscopic vision, shape, color, brightness, and position in the field. Discusses the invariance hypothesis with reference to the size-distance invariance hypothesis.

Part three. Special problems in visual space perception. Discusses perceptual conflicts and resolutions. Includes the perception of persons as visual objects.

Kidd, Aline H. and Kidd, Robert M. The development of auditory perception in children. In *Perceptual Development in Children*, edited by A. H. Kidd and J. L. Rivoire, pp. 113-143. New York: International Universities Press, 1966.

Includes experimental studies involving prenatal research and infant research. Reviews auditory perception studies using selected intensity, pitch, or timbre variables.

Lynn, R. Attention, Arousal, and the Orientation Reaction. New York: Pergamon Press, 1966.

Describes the components of the orientation reaction for normal and mentally defective children. Explains the role of the orientation reaction in the acquisition of motor skills (pp. 85-88).

Mann, Lester. Perceptual training: Misdirections and redirections. *American Journal of Orthopsychiatry* 40 (1970): 30-38.

Presents an excellent critique of perceptual training programs. Lists five grounds for annulling the relationship between perceptual training and education.

Mueller, Conrad G. *Sensory Psychology*. Englewood Cliffs, N.J.: Prentice-Hall, 1965.

An introductory book explaining the nature of the visual, auditory, taste, smell, touch, temperature, vestibular, and kinesthetic senses.

Murray, F. B. Notes on some logical and empirical difficulties in perceptual-motor training programs. *American Corrective Therapy Journal* 24 (1970): 23-24.

Discusses the lack of theoretical and empirical support for the assumptions that: (1) motor learning is the basis for all subsequent learning and, (2) retraining of previously slighted motor skills is possible.

Pick, Herbert L. and Pick, Anne D. Sensory and perceptual development. In *Carmichael's Manual of Child Psychology*, edited by P. Mussen, vol. 1. New York: John Wiley & Sons, 1970.

Includes the development of visual, auditory, and tactual sensitivity in young children. Summarizes the research concerned with laterality, body image, orientation, intermodal relations, and visual and tactual sensitivity of young children. Discusses the relation of attention to environmental stimuli and visual search patterns in children. Includes these theories of perceptual development: Piaget, Hebb, and the neurophysiological approach.

Pronko, N.; Ebert, R.; and Greenberg, G. A critical review of the theories of perception. In *Perceptual Development in Children*, edited by A. H. Kidd and J. L. Rivoire, pp. 55-78. New York: International Universities Press, 1966.

Describes the classical views and modern theories of perception. Includes these modern theories of perception: Gestalt theory's configuration approach, topological field theory, cell-assembly and phase-sequence theory, sensory-tonic field theory, set and motor adjustments, adaptation level, perceptual norm and frame of reference theories, function and molar theories, directive-state theory, hypothesis theory, learning theory, and cybernetic or system theory.

Reese, Hayne and Lipsitt, Lewis. *Experimental Child Psychology*. New York: Academic Press, 1970.

Chapter two. Sensory processes. Reviews the developmental studies of sensory processes by dividing the studies into the following three groups

according to experimental procedures: reflex, habituation, and conditioning. The development of visual perception includes brightness, hue, acuity, form, and depth studies. The development of auditory perception includes amplitude, frequency, and localization. Other topics included are pressure, touch, pain, and thermal sensitivity.

Rivoire, Jeanne L. and Kidd, Aline H. The development of perception of color, space and movement in children. In *Perceptual Development in Children*, edited by A. H. Kidd and J. L. Rivoire, pp. 81-112. New York: International Universities Press, 1966.

Reviews developmental studies of brightness, saturation, form, object, figure-ground, and movement perception with infants, young children, and school aged children. Discusses Gestalt factors in perceptual organization.

Smith, Hope M. Implications for movement education experiences drawn from perceptual-motor research. *Journal of Health, Physical Education, Recreation* 41 (1970): 30-33.

Relates the results of research on the following topics to motor skill learning: organic development, matching and classifying, figure-ground phenomenon, depth perception, size constancy, phi phenomenon, and retinal inhibition. Reviews research on the following areas of auditory perception: organic development, auditory figure-ground, directionality of sound, and auditory rhythm perception. Discusses research concerning tactile perception, balance mechanisms, and proprioception.

Smith, Hope M. Motor activity and perceptual development. *Journal of Health, Physical Education, Recreation* 39 (1968): 28-33.

Discusses implications for physical education drawn from the historical background of perceptual-motor theory, and need for objective evidence from research studies of motor therapy programs. Describes the role of the physical educator within the structure of a motor therapy program.

Smith, Hope M. Movement and perception. In *Introduction to Human Movement*, edited by H. M. Smith, pp. 49-59. Reading, Mass.: Addison-Wesley Publishing Co., 1968.

Discusses the effect of perception on movement and describes the relationship of vision to other sensory modes.

Spears, William C. and Hohle, Raymond H. Sensory and perceptual processes in infants. In *Infancy and Early Childhood*, edited by Y. Brackbill, pp. 123-203. New York: The Free Press, 1967.

Explains the physical development of the vision and audition systems of infants. Includes relevant research concerning color discrimination, shape, pattern, constancy, space, and depth perception of infants.

Stevens, S. S.; Warshofsky, Fred; and the Editors of Life. Sound and Hearing. New York: Time Incorporated, 1965.

Uses picture essays to explain the auditory system. Includes an excellent explanation of the anatomy of the ear.

Trussel, Ella M. Relation of performance of selected physical skills to perceptual aspects of reading readiness in elementary school. *Research Quarterly* 40 (1969): 383-390.

Investigates the interrelationships of the elements of visual, motor, and reading functions in first and second grade children. Reading development, perceptual development, and motor development are more likely to exhibit independence, rather than association with each other. The Marianne Frostig Development Test of Visual Perception, reading achievement and discrimination subtests of the Metropolitan Achievement Test, and the Lincoln-Oseretsky Motor Development Scale are used to measure visual, reading, and motor functioning of the children included in this study. Two perceptual-motor tasks are included in this study: a task requiring the child to place a stylus on a rotating target, and a task requiring the child to stand on a modified stabilometer apparatus.

Wapner, Seymour and Werner, Heinz. *Perceptual Development: An Investigation Within the Sensory-Tonic Field Theory*. Worcester, Mass.: Clark University Press, 1957.

Outlines the sensory-tonic field theory of perception and reports eleven developmental studies using children between ages 6 and 18.

Wohlwill, J. F. Developmental studies of perception. *Psychological Bulletin* 57 (1960): 249-288.

Reviews developmental studies of perception which involve two or more age groups. Includes sensory thresholds, illusions, orientation and localization, the constancies, depth, form, number, movement, time, and perceptual learning studies. Concludes by summarizing major developmental trends uncovered in this review.

Wright, Logan. Highlights of human development, birth to age eleven. In *Perceptual-Motor Foundations: A Multidisciplinary Concern*, pp. 1-22. Washington, D.C.: American Association for Health, Physical Education, and Recreation, 1969.

Reviews Piaget's theory and Hebb's theory with regard to current child development research. Summarizes infrahuman research involving stimulus deprivation and enrichment, and human research involving stimulus enrichment.

Zaporozhets, A. V. The development of perception in the preschool child. Monographs of the Society for Research in Child Development 30 (1965): 82-101.

Reviews experiments completed at the Laboratory of Psychology of Preschool Children of the Institute of Psychology and the Laboratory of Psychophysiology at the Institute of Preschool Education of the Academy of Pedagogical Sciences in Moscow. The experiments investigate the process of development of perceptive actions on the formation of sensory images during different periods of early childhood. Reviews experiments involving visual and tactual exploration of selected forms and shapes, and auditory discrimination.

Part I

Works of
Individuals

The Work of || A. Jean Ayres

Ayres, A. Jean. Ayres Space Test. Los Angeles: Western Psychological Services, 1962.

Ayres, A. Jean. Effect of Sensorimotor Activity on Perception and Learning in the Neurologically Handicapped Child. Los Angeles: University of Southern California, 1968. (Education Resources Information Center, U.S. Office of Education, 400 Maryland Ave., S.W., Washington, D.C., ED 033 757, Microfiche)

Investigates relationships among perceptual functions in children with either an emotional or learning disorder.

A battery of neuromuscular, perceptual-motor, psycholinguistic and academic tests was given to 36 children with normal intelligence and evidence to either an emotional or learning disorder. Two types of reading-related neuro-developmental syndromes were found: one included auditory language and sequencing deficits, and the other included the postural mechanisms and the integration function for both sides of the body. The second syndrome was more related to academic deficits than the other identified patterns of dysfunction.

Ayres, A. Jean. The Eleanor Clarke Slagle lecture: The development of perceptual-motor abilities. A theoretical basis for treatment of dysfunction. *American Journal of Occupational Therapy* 17 (1963): 221-225.

Investigates relationships among perceptual-motor functions in children suspected of having perceptual deficiencies. A battery of visual, tactile, and proprioceptive perception and motor skills test was administered to 100 children approximately six or seven years of age who had suspected perceptual deficiencies. Five major syndromes of perceptual motor dysfunctions were found: apraxia, perceptual dysfunction of form and position in space, deficit integration of both sides of the body, visual figure-ground dysfunction, and tactile defensiveness.

Ayres, A. Jean. Interrelation of perception, function, and treatment. *Physical Therapy* 46 (1966): 741-744.

Discusses the relation between concepts of perception and motor function.

Ayres, A. Jean. Interrelations among perceptual-motor abilities in a group of normal children. *American Journal of Occupational Therapy* 20 (1966): 288-292.

Investigates relationships among perceptual-motor functions in a sample of children. A battery of perceptual-motor tests was administered to 64 children between the ages of four and eight. After factor analysis, three factors were identified: visual motor ability, an interaction of functions of two sides of the body with emphasis on tactile perception, and tactile defensiveness.

Ayres, A. Jean. Interrelationships among perceptual-motor functions in children. *American Journal of Occupational Therapy* 20 (1966): 68-71.

Investigates relationships among perceptual-motor functions in a predominantly normal sample of children. A battery of 19 perceptual-motor tests was administered to 92 children between the ages of four and eight. After factor analysis, two factors emerged: one was a general perceptual-motor ability dominated by tactile, kinesthetic, and motor functions, and the second was visual perception.

Ayres, A. Jean. Patterns of perceptual-motor dysfunction in children: A factor analytic study. *Perceptual and Motor Skills* 20 (1965): 335-368.

Investigates relationships among perceptual-motor functions in normal children and atypical children. A battery of 35 perceptual-motor tests was given to 100 children representing a normal school population and 50 atypical children selected on the basis of suspected perceptual deficits which were reflected in learning problems. Different factors were found for each group.

Ayres, A. Jean. Perspectives on neurological bases of reading. In *Claremont Reading Conference Yearbook*, vol. 28, pp. 113-118. Claremont, Calif.: Claremont Graduate School, 1964.

Investigates relationships among perceptual-motor functions in children exhibiting a behavior or learning disorder. A battery of tests covering visual, tactile, and kinesthetic perception, motor ability, laterality, and number concepts was administered to 100 children, approximately six or seven years old, who were selected because they exhibited a learning or behavior disorder. Five major syndromes were identified; apraxia, perceptual dysfunction of form and position in two dimensional space, deficit integration of both sides of the body, visual figure-ground discrimination dysfunction, and tactile defensiveness.

Ayres, A. Jean. Sensory integrative processes and neuropsychological learning disabilities. *Learning Disorders*, edited by J. Hellmuth, vol. 3, pp. 41-58. Seattle: Special Child Publications, 1968.

Describes the following methods of sensory integrative function: (1) intersensory integration, (2) centrifugal influence, (3) modification through feed back, and (4) balancing of excitatory and depressant neural activity. Discusses the application of the theoretical sensory integrative functions to therapeutic procedures.

Ayres, A. Jean. *Southern California Motor Accuracy Test*. Los Angeles: Western Psychological Services, 1964.

Ayres, A. Jean. Tactile functions: Their relation to hyperactive and perceptual motor behavior. *American Journal of Occupational Therapy* 18 (1964): 6-11.

Presents a theory about the nature of a clinical syndrome of which hyperactive, distractable behavior is an element. The theory only explains those aspects of hyperactivity and distractibility associated with tactile functions. Includes a review of literature supporting her theory.

Burstein, Alvin G. Review of The Ayres Space Test. 3d ed. In *The Sixth Mental Measurement Yearbook*, pp. 151-152. Highland Park, N.J.: Gryphon Press, 1965.

Discusses the purpose of the test and describes the carelessness in the construction of the manual. Explains the presentation of inadequate standardization data. The test was not recommended for general use.

Heilbrun, Alfred B. Review of The Ayres Space Test. 3d ed. In *The Sixth Mental Measurement Yearbook*, pp. 152-153. Highland Park, N.J.: Gryphon Press, 1965.

Describes the purpose of the test. Points out the total lack of validating evidence for the test. Critiques the four studies described in the validation section of the test manual. Describes the manual as claiming too much and providing too little. Suggests the test user employ this test with considerable caution until its merits are more clearly established.

The Work of || Ray Barsch

Barsch, Ray H. Achieving Perceptual Motor Efficiency. Seattle: Special Child Publications, 1967.

Presents a detailed description of Barsch's theory and methodology for all handicapped children (learning disabilities, mentally retarded, blind and visually limited, deaf and acoustically handicapped, muscular limited, emotionally disturbed, and socially underprivileged) and the "plain-vanilla" child.

Barsch, Ray H. The concept of reach-grasp-release as a visual, auditory, and tactual process. *Journal of Genetic Psychology* 106 (1965): 237-243.

Presents a developmental table describing the sequence of learning reach-grasp-release in visual, auditory, and tactual modes. No age norms were given.

Barsch, Ray H. The concept of regression in the brain-injured child. *Exceptional Children* 27 (1960): 84-89.

Defines three basic kinds of regression: instrument act regression, age regression, and primitivation. Lists 31 changes which may precipitate regression in brain-damaged children. Describes "security lessons" for regression periods in order to develop normal sensitivity to change.

Barsch, Ray H. The concept of temporal tolerance. *American Journal of Occupational Therapy* 17 (1963): 101-105.

Describes temporal factors related to helping the brain-damaged child achieve his optimal state of learning. Suggests more tightly organized activity and less free activity in the classroom.

Barsch, Ray H. Enriching Perception and Cognition. Seattle: Special Child Publications, 1968.

Barsch, Ray H. Evaluating the organic child: The functional organization scale. *Journal of Genetic Psychology* 100 (1962): 345-354.

The Functional Organization Scale can be used for the evaluation of children from 1 year to 16 years old. The test is divided into three sections: normative, observative, and deductive. Motor development is one of 13 items of the normative section. Performance on each item is rated as either organized, immature, or disorganized. The scale classifies brain-damaged children into one of four learning categories: behavior, symbolic, immature, and sensorimotor.

Barsch, Ray H. Explanations offered by parents and siblings for brain-damaged children. *Exceptional Children* 27 (1961): 286-291.

Investigates explanations given by parents and siblings concerning brain-damaged children. Checklists were used to evaluate the explanations given by parents and siblings. Six conclusions are made about the explanations.

Barsch, Ray H. A Movigenic Curriculum: An Experimental Approach to Children with Special Learning Disabilities Conducted at the Longfellow School, Madison, Wisconsin, during the 1964-1965 School Year. Madison, Wis.: State Department of Public Instruction, 1965. (Education Resources Information Center, U.S. Office of Education, 400 Maryland Ave., S.W., Washington, D.C., ED 011 153, Microfiche.)

Describes the proper class placement and curriculum for children with learning disabilities. Presents the rationale for the project according to the intellectual, psychiatric, and physiological approaches. Explains the eight constructs that serve as a nucleus for the movement theory. Discusses classroom organization and selected curriculum items. Defines the 12 dimensions used to plan the curriculum. Summarizes negative and positive aspects of the program.

Barsch, Ray H. Perspectives on learning disabilities: The vectors of a new convergence. *Journal of Learning Disabilities* 1 (1968): 4-20.

Discusses the past, present, and future of learning disabilities programs.

Barsch, Ray H. Six factors in learning. In *Learning Disorders*, edited by J. Hellmuth, vol. 1, pp. 329-343. Seattle: Special Child Publications, 1965.

Discusses the influence of the following six learning factors on the classroom environment: space, time, multiplicity, level, language, and relationship.

Barsch, Ray H. A viewpoint of co-ordination in rehabilitation services: A geometric of social interaction. *Rehabilitation Literature* 24 (1963): 298-301.

Uses space, time, and movement terminology to describe human welfare agencies. Describes these agencies as being composed of "project co-ordinators" and "co-ordinating councils" searching for "co-ordinative efficiency."

The Work of || Robert Doman and
|| Carl Delacato

American Academy of Neurology: Joint executive board statement — The Doman-Delacato treatment of neurologically handicapped children. *Neurology* 17 (1967): 637.

Presents a Joint Executive Board Statement of the American Academy of Pediatrics and American Academy of Neurology regarding the Doman-Delacato treatment of neurologically handicapped children. Discusses the lack of controlled studies supporting the Doman-Delacato training program, the parent's role in the program, needed evaluation of the program, and cases in which the Doman-Delacato program appears not to have helped the patient.

Bird, John. When children can't learn. *Saturday Evening Post* 240 (July 29, 1967): 27-31, 72-74.

Describes the Doman-Delacato theory and treatment procedures. Includes selected photographs of the training program.

Cecilia, Sister Joseph. Doman-Delacato approach to the teaching of reading. *Montana Education* 42 (Feb. 20, 1966): 17-22.

Applies the theory of Doman-Delacato to teaching reading.

Cohn, Robert. Neurological study of children with learning disabilities. *Exceptional children* 31 (1964): 179-185.

Defines the minimal neurological signs in individuals who have difficulty acquiring verbal language function as not equatable with minimal brain damage. Discusses the relationship between neurological study and language development. (The author is a research neurologist.)

Delacato, Carl H. The Diagnosis and Treatment of Speech and Reading Problems. Springfield, Ill.: Charles C. Thomas, 1963.

Presents Delacato's neurological organization theory and treatment procedures for the brain-injured child.

Delacato, Carl H. Neurological Organization and Reading. Springfield, Ill.: Charles C. Thomas, 1966.

Presents an overview of Delacato's theory, and application of the theory to brain-damaged children. Describes 10 scientific experiments supporting Delacato's theory.

Delacato, Carl. The ontogeny of reading problems. In Claremont Reading Conference Yearbook, vol. 27, pp. 119-125. Claremont, Calif.: Claremont Graduate School, 1963.

Explains the theory of neurological organization and relates the theory to the development of reading problems.

Delacato, Carl H. The Treatment and Prevention of Reading Problems. Springfield, Ill.: Charles C. Thomas, 1954.

Presents Delacato's "neurological organization" theory and treatment procedures for the brain-injured child.

Delacato, Carl and Robbins, Melvyn. Letters to the editor. *Exceptional Children* 33 (1966): 199-202.

First letter. Delacato critiques a research study by Robbins.

Second letter. Robbins defends his research with regard to Delacato's criticisms.

Doman, Robert J. et al. Children with severe brain injuries: Neurological organization in terms of mobility. *American Medical Association Journal* 174 (1960): 257-262.

Investigates the application of the Delacato theory to brain-injured children. Each child received a neurological organization training program for 6 to 20 months. Mobility improvement was found. The results are presented graphically for easy interpretation.

Freeman, Roger D. Controversy over "patterning" as a treatment for brain damage in children. *American Medical Association Journal* 202 (1967): 385-388.

Summarizes the controversy over the validity of the results of Doman-Delacato's treatment methods. Describes the "patterning" theory and technique. Lists nine objections to the Doman-Delacato treatment for brain damage in children.

Freeman, Roger D. Review of Kershner, J. R.: An investigation of the Doman-Delacato theory of neuropsychology as it applies to trainable retarded children in public schools. *Journal of Pediatrics* 71 (1967): 914-915.

Critiques a study, reported by Kershner, which supports the Doman-Delacato theory.

Glass, Gene V. and Robbins, Melvyn P. A critique of experiments on the role of neurological organization in reading performance. *Reading Research Quarterly* 3 (1968): 5-51.

Reviews and critiques 15 studies reported by Delacato as evidence of the positive effects of his neurological organization training program. Shows all 15 studies to be of dubious value because of major faults in the design and analysis.

Harris, Albert J. What about these special theories of reading? Paper presented at International Reading Association Convention, Current Issues Program, April 27, 1968, Boston. (Education Resources Center, U.S. Office of Education, 400 Maryland Avenue, S.W., Washington, D.C., ED 023 541, Microfiche.)

Reviews four approaches to teaching remedial reading: Doman-Delacato, Kephart, Frostig, and the contribution of pharmacology to children with reading disabilities. Recommends more carefully controlled research since none of the four methods has produced conclusive evidence of its effectiveness.

Huspath, W. J. The neurological implausibility of the Delacato theory. In *Claremont Reading Conference 28th Yearbook*, vol. 28, pp. 126-131. Claremont, Calif.: Claremont Graduate School, 1964.

Critiques Delacato's theory from the standpoint of physiological-neurological research. Discusses hemispheric dominance and sensorimotor organization.

Ihinger, Robert F. Lateral dominance and reading achievement. In *Claremont Reading Conference 27th Yearbook*, vol. 27, pp. 129. Claremont, Calif.: Claremont Graduate School, 1963.

Summarizes the research literature concerning the existence of lateral dominance in the central nervous system. Critiques the research literature that relates lateral dominance to reading.

Kershner, John R. Doman-Delacato's theory of neurological organization applied to retarded children. *Exceptional Children* 34 (1968): 441-450.

Assesses the effects of a Doman-Delacato training program on the physical and intellectual development of mentally retarded children. The

children in the study ranged in age from 8 to 18 years old. The control group received 74 days of nonspecific activity, and the experimental group received 74 days of activities suggested by Delacato. After 74 days, the experimental group made greater gains in intelligence (Peabody Picture Vocabulary Test) and mobility (creeping and crawling).

Klesius, Stephen E. Perceptual-motor development and reading. Paper presented at National College Reading Association Conference, March 19-21, 1970, Philadelphia. (Educational Resources Center, U.S. Office of Education, 400 Maryland Ave., S.W., Washington, D.C., ED 040 823, Microfiche)

Reviews 28 research studies which investigate the effect of perceptual-motor training programs on the reading achievement of average or above average children. Discusses the effectiveness of Delacato's and Frostig's programs.

Krippner, Stanley. Research in Visual Training and Reading Disability. Washington, D.C.: Educational Resources Center, U.S. Office of Education, 1968. (ED 027 151, Microfiche).

Reviews and critiques the theories of Doman-Delacato, Kephart, Getman, and Frostig. Interprets current research relating to these theories. Discusses the role of visual training in the treatment of reading disabilities.

LeWinn, Edward B. Human Neurological Organization. Springfield, Ill.: Charles C. Thomas, 1969.

LeWinn, Edward B. et al. Neurological organization: The basis for learning. In Learning Disorders, edited by J. Hellmuth, vol. 3, pp. 51-93. Seattle: Special Child Publications, 1968.

Presents an overview of the Doman-Delacato theory including concepts, diagnosis, and treatment.

Maisel, A. Q. Hope for brain-injured children. Reader's Digest 85 (1964): 135-140.

Describes the Doman-Delacato theory. Includes one case history.

O'Donnel, Patrick and Eisenson, John. Delacato training for reading achievement and visual-motor integration. Journal of Learning Disabilities 2 (1969): 441-450.

Investigates the Doman-Delacato training program. Sixty children, meeting a disabled reader criteria, were selected from grades two, three, and four to participate in the 20-week study. One treatment group received a training program suggested by Delacato; one treatment group received a training program suggested by Delacato and traditional physical education; and one treatment

group received only traditional physical education. No group differences were found after the treatments in reading and visual-motor integration.

Ottinger, L. The theory from the standpoint of pediatrics. In Claremont Reading Conference 28th Yearbook, vol. 28, pp. 123-136. Claremont, Calif.: Claremont Graduate School, 1964.

Presents a pediatrician's viewpoint of the Delacato theory. Considers Delacato's data to be fallacious, rational poor, and conclusions untenable.

Perkins, T. F. Problems arising from assertions or assumptions of Delacato. Claremont Reading Conference 28th Yearbook, vol. 28, pp. 119-123. Claremont, Calif.: Claremont Graduate School, 1964.

Presents an overview of problems and questions arising from Delacato's theory. Includes a review of related child development research.

Robbins, Melvyn P. The Delacato interpretation of neurological organization. *Exceptional Children* 32 (1966): 517-523.

Robbins, Melvyn P. The Delacato interpretation of neurological organization. *Reading Research Quarterly* 1 (1966): 57-78.

Assesses the influence of the Doman-Delacato neurological organization program on reading and lateral development of second grade children. The experimental group was given a three-month training program based on the Doman-Delacato theory. During this time they were not given music. The non-specific training group at this time was involved in music activities, games, and dances. The results of this study did not support Doman-Delacato's theory. The Delacato curriculum did not even enhance the lateral development of the children.

Robbins, Melvyn P. A study of the validity of Delacato's theory of neurological organization. *Exceptional Children* 32 (1966): 613-623.

Robbins, Melvyn P. Test of the Doman-Delacato rationale with retarded readers. *American Medical Association Journal* 202 (1967): 389-393.

Tests the theoretical and practical implications of the Doman-Delacato rationale with retarded readers. The study included 149 children, grades three to nine, enrolled in a summer reading program. The children were placed in one of four groups: Delacato training program at school, Delacato training program at home, non-specific training program at school, and non-specific training program at home. The purpose of the non-specific training program was to control for the "Hawthorne," placebo, or attention effects. The non-specific groups were given a general program of activities not known to be related to reading achievement. The results of this study did not support the Doman-Delacato rationale. No reading differences were found after the Delacato and non-specific training programs.

Spitzer, Robert L.; Rabkin, Richard; and Kramer, Yale. Relationship between "mixed dominance" and reading disabilities. *Journal of Pediatrics* 54 (1959): 76-80.

Investigates the relationship between "mixed dominance" and reading ability. The study included 103 reading disabled children, who were between the ages of 9 and 13, in the experimental group, and 208 children, who were not enrolled in a remedial reading program in the control group. No differences were found between the two groups with regard to incidence of mixed dominance.

Stephens, W. E.; Cunningham, E. S.; and Stigler, B. J. Reading readiness and eye-hand preference patterns in first grade children. *Exceptional Children* 33 (1967): 481-488.

Investigates the eye-hand preference patterns of 89 first grade children. No differences in reading level were found with regard to eye-hand preference patterns and sex of first grade children. The authors question the suitability of minimal brain dysfunction theories for explaining reading disability.

Stone, Mark and Pielstick, N. L. Effectiveness of Delacato treatment with kindergarten children. *Psychology in the Schools* 5 (1969): 63-68.

Examines the effect of the Delacato training program on reading readiness, intelligence, and visual perception. Thirteen kindergarten children were in the experimental group, and the same number of children were in the control group. The experimental group was given 30 minutes of neurological training each school day for 18 weeks. During this time, the control group was given games and play activity. Only the visual perception of the experimental group was better than the control group after 18 weeks of training. Visual perception was measured by the Frostig Test of Visual Perception.

The Work of || Marianne Frostig

Allen, Robert; Dickman, Isadore; and Haupt, Thomas. A pilot study of the immediate effectiveness of the Frostig-Horne training program with educable retardates. *Exceptional Children* 33 (1966): 41-42.

Investigates the use of the Frostig program with trainable retarded children. Ten children were assigned to the experimental group and six children were assigned to the control group. Only the experimental group received a one semester program suggested by Frostig. The experimental group improved more than the control group after one semester.

Anderson, James M. Review of the Marianne Frostig Developmental Test of Visual Perception. 3d ed. In *The Sixth Mental Measurement Yearbook*, pp. 854-856. Highland Park, N.J.: Gryphon Press, 1965.

Describes the purpose of the test, and critiques the instructions for the test. Considers the information needed to evaluate this test to be incomplete and haphazardly presented in the test manual.

Austin, Mary C. Review of the Marianne Frostig Developmental Test of Visual Perception. 3d ed. In *The Sixth Mental Measurement Yearbook*, pp. 856-857. Highland Park, N.J.: Gryphon Press, 1965.

Describes the purpose of the test and evaluates the directions to the examiner and the child. Considers the scoring to be objective and describes standardization and reliability. Considers the test as a useful screening tool for nursery school, kindergarten, and first grade children who need special perceptual training in the five important areas of visual perception.

Boyd, Larry and Randle, Kenneth. Factor analysis of the Frostig developmental test of visual perception. *Journal of Learning Disabilities* 3 (1970): 253-255.

The Frostig test and an intelligence test were administered to 94 first grade children. The Frostig subtests, "Position in Space" and "Spatial

Relations," had very little variance and therefore, could not differentiate underlying perceptual ability in the manner specified by Frostig's standardization. These results question the content validity of the test. The experimenter suggests that the "Perceptual Quotient" be used as a unitary measure of perceptual function rather than as a cumulative measure of five independent visual perceptual abilities.

Briggs, Peter F. and Telligen, Duke. Further normative data on a Frostig subtest, eye-hand coordination. *Perceptual and Motor Skills* 30 (1970): 640-642.

Test One (Eye-Hand Coordination) of the Frostig test was given to children and adults between 4 and 39 years old. The results were compared to the norms of the 1963 standardization. Frostig's standardization scores were confirmed through age 7, and then the scores were found to be considerably below those reported by the 1963 standardization.

Cohen, S. Alan. Studies in visual perception and reading in disadvantaged children. *Journal of Learning Disabilities* 2 (1962): 498-503.

Evaluates measures of visual perception including the Frostig test. Discusses the relationship between visual dysfunction and reading.

Corah, N. C. and Powell, B. J. A factor analytic study of the Frostig developmental test of visual perception. *Perceptual and Motor Skills* 16 (1963): 59-63.

Examines a factor analysis of the Frostig test and subtest scores, a form discrimination test, a form constancy test, intelligence, age, and sex for 40 kindergarten children. Intelligence and developmental changes in perception accounted for most variance. Recommends only the "Perceptual Quotient" from the Frostig test as a useful measure, since the scatter analysis of the Frostig subtests is a dubious value.

Culbertson, W. and Gunn, R. Comparison of the Bender Gestalt test and Frostig test in several clinical groups of children. *Journal of Clinical Psychology* 22 (1966): 439.

Indicates intelligence is an important factor in visual perceptual performance. The two tests are closely related but the differences are noted.

Frostig, Marianne. Corrective reading in the classroom. *The Reading Teacher* 18 (1965): 573-580.

Describes the following methods of teaching reading: labeling, highly controlled vocabulary, child's own book, phonics, color cues, kinesthetic methods, and blind writing.

Frostig, Marianne. Education for children with learning disabilities. In *Progress in Learning Disabilities*, edited by H. Myklebust, pp. 234-266. New York: Grune & Stratton, 1968.

Describes the components of the developmental sequence: sensory-motor phase, language phase, perceptual phase, development of higher cognitive processes, emotional development, and social adjustment.

Frostig, Marianne. Marianne Frostig Center of Education Therapy. In *Special Education Programs Within the United States*, edited by M. V. Jones, pp. 122-148. Springfield, Ill.: Charles C. Thomas, 1968.

Presents a complete description of the Marianne Frostig Center of Education. Discusses the evolution of the center's philosophy, the center's services, professional training, research, and future plans. The bibliography includes 102 references.

Frostig, Marianne. Testing as a basis for education therapy. *Journal of Special Education* 2 (1967): 15-34.

Describes four basic tests used to evaluate sensorimotor functions: Frostig Test, Wepman Test, Illinois Test of Psycholinguistic Abilities, and the Wechsler Intelligence Scale for Children.

Frostig, Marianne. Visual perception in the brain injured child. *American Journal of Orthopsychiatry* 33 (1963): 665-671.

Describes the Frostig test and includes samples of items.

Frostig, Marianne and Horne, David. An approach to the treatment of children with learning disorders. In *Learning Disorders*, edited by J. Hellmuth, vol. 1, pp. 293-305. Seattle: Special Childhood Publications, 1965.

Presents a brief overview of Frostig's theory. Appendix lists 28 tests or methods of assessment used at the Frostig Center.

Frostig, Marianne; Lefever, D. Welty; and Whittlesey, John. Disturbances in visual perception. *Journal of Education Research* 58 (1963): 160-162.

Describes the Frostig test and its application in the classroom.

Frostig, Marianne and Maslow, Phyllis. Language training: A form of ability training. *Journal of Learning Disabilities* 1 (1968): 105-115.

Describes four developmental functions: sensorimotor, language, perception, and cognitive. Reviews and critiques the Illinois Test of Psycholinguistics and discusses the relation between this test and the Frostig test.

Frostig, Marianne and Maslow, Phyllis. Reading, developmental abilities, and the problem of the march. *Journal of Learning Disabilities* 2 (1969): 571-574.

Responds to an article written by Cohen on visual perception and reading.

Harris, Albert J. What about these special theories of reading? Paper presented at International Reading Association Convention, Current Issues Program, April 27, 1968, Boston. (Education Resources Center, U.S. Office of Education, 400 Maryland Ave., S.W., Washington, D.C., ED 023 541, Microfiche)

Reviews four approaches to teaching remedial reading: Doman-Delacato, Kephart, Frostig, and the contribution of pharmacology to children with reading disabilities. Recommends more carefully controlled research since none of these four methods has produced conclusive evidence of its effectiveness.

Jacobs, James W. An evaluation of the Frostig visual-perception training program. *Educational Leadership* 25 (1968): 332-340.

Investigates the effect of the Frostig training program on reading readiness. Kindergarten children who participated in the Frostig program, when compared to children not enrolled in the program, did not perform better on a reading readiness test.

Jacobs, James W. A follow-up evaluation of the Frostig visual-perceptual training program. *Educational Leadership* 26 (1968): 169-175.

Investigates the effect of the Frostig training program on reading readiness. Children in kindergarten and first grade after nine months of the Frostig training program performed better on the Frostig test and a reading readiness test than the control group. The first grade children, who were given the Frostig program, and the control group performed the same on the reading achievement tests, and many of the differences on the reading subtests favored the control group.

Kleim, Richard. Visual-motor training, readiness, and intelligence in kindergarten children. *Journal of Learning Disabilities* 3 (1970): 256-259.

Investigates the effect of visual-motor training on readiness and intelligence of kindergarten children. The experimental and control groups each had 37 children exhibiting visual-motor deficiencies on the Bender Test. A second control group had only children exhibiting no visual-motor deficiencies. During the training period, only the experimental group received visual-motor training according to the Winter Haven program.

The control groups received the traditional kindergarten program. The fact that no readiness and intelligence differences were found among the groups at the end of the school year suggested further research is necessary before visual-motor training becomes a part of the general kindergarten curriculum.

Klesius, Stephen E. Perceptual-motor development and reading. Paper presented at National College Reading Association Conference, March 19-21, 1970, Philadelphia. (Educational Resources Information Center, U.S. Office of Education, 400 Maryland Ave., S.W., Washington, D.C., ED 040 823, Microfiche)

Reviews 28 research studies which investigate the effect of perceptual-motor training programs on the reading achievement of average or above-average children. Discusses the effectiveness of Delacato's and Frostig's programs.

Krippner, Stanley. Research in Visual Training and Reading Disability. Washington, D.C.: Educational Resources Information Center, U.S. Office of Education, 1968. (ED 027 151, Microfiche).

Reviews and critiques the theories of Doman-Delacato, Kephart, Getman, and Frostig. Interprets current research relating to these theories. Discusses the role of visual training in the treatment of reading disabilities.

Little people: When the mind can't see what the eye sees: Frostig program for visual perception. *Grade Teacher* 83 (1965): 82-85.

Briefly describes the Frostig test and training program.

Maslow, Phyllis et al. The Marianne Frostig developmental test of visual perception, 1963 standardization. *Perceptual and Motor Skills* 19 (1964): 463-499.

Summarizes the statistical data on the 1963 standardization sample of over 2,100 nursery and public school children who were given the Frostig test.

Olsen, Arthur V. Factor analytic studies of the Frostig developmental test of visual perception. *Journal of Special Education* 2 (1968): 429-433.

Reviews research on the five subtests of the Frostig test with regard to the measurement of separate and definable perceptual abilities on the subtests.

Olsen, Arthur V. Relation of achievement test scores and specific reading abilities to Frostig developmental test of visual perception. *Perceptual and Motor Skills* 22 (1966): 179-184.

Investigates the prediction value of the Frostig test to general achievement of second grade children. The Frostig test has limited value as a predictor of achievement since many reading tests and subtests predicted achievement with less error. Four of the five subtests of the Frostig test are related to specific reading abilities.

The Work of || Newell Kephart

Benyon, Shelia D. *Intensive Programming for the Slow Learner*. Columbus, Ohio: Charles E. Merrill Publishing Co., 1968.

Describes an intensive program for slow learners. Includes case histories of the children, daily lesson plans for the children, and a discussion of the results. The daily lesson plans include perceptual-motor and aquatics activities.

Chaney, Clara M. and Kephart, Newell C. *Motoric Aids to Perceptual Training*. Columbus, Ohio: Charles E. Merrill Publishing Co., 1968.

Presents Kephart's theories concerning the motor system, motor generalization, exploration, cognition, and developmental sequences. Discusses evaluation, listening, differentiation of body parts, ocular motor coordination, and speech readiness.

Dillon, Edward J.; Heath, Earl J.; and Biggs, Carrol W. *Comprehensive Programming for Success in Learning*. Columbus, Ohio: Charles E. Merrill Publishing Co., 1970.

Describes "Project Child," a project to develop a systematic developmental curriculum based on the methods advocated by Kephart.

Dunsing, Jack D. and Kephart, Newell K. *Motor generalization in space and time*. In *Learning Disorders*, pp. 77-121. Seattle: Special Childhood Publications, 1965.

Discusses the Kephart theory with regard to the following topics: basic readiness, tactual experiences versus tactual perception, movement skills, patterns, generalizations, perception in newborn infants, and body schema. Explains the following basic motor generalizations: posture and maintenance of balance, locomotion, and contact. Defines the perceptual-motor match, directionality, and midline problems.

Early, George H. *Perceptual Training in the Curriculum*. Columbus, Ohio: Charles E. Merrill Publishing Co., 1969.

Summarizes Kephart's theory of perceptual development. Discusses the application of Kephart's theory to social studies, language arts, science, and industrial arts.

Early, George H. and Kephart, Newell C. Developing perceptual-motor skills: Perceptual-motor training and academic achievement. *Academic Therapy* 4 (1969): 201-206.

Discusses a case history of a nine-year-old boy enrolled in remedial reading.

Falik, Louis. The effects of special perceptual-motor training in kindergarten on reading readiness and on second grade reading performance. *Journal of Learning Disabilities* 2 (1969): 395-402.

Investigates the effect of a training program suggested by Kephart on reading. The experimental group received a training program suggested by Kephart, and the control group received the traditional curriculum. No reading differences were found between the two groups after the training program.

Fisher, Kirk L. Effects of a Structured Program of Perceptual-Motor Training on the Development and School Achievement of Educable Mentally Retarded Children. University Park, Pa.: Pennsylvania State University, 1967. (Educational Resources Information Center, U.S. Office of Education, 400 Maryland Ave., S.W., Washington, D.C., ED 040 516, Microfiche)

Investigates the application of Kephart's theory to mentally retarded children. The Purdue Perceptual-Motor Survey was used to identify mentally handicapped children who were also deficient in perceptual-motor ability. These 54 children made up the experimental group. The Hawthorne (attention control groups) included 54 mentally handicapped children who were not deficient in perceptual-motor ability. The experimental groups participated in a training program suggested by Kephart, and the Hawthorne groups played table games for the same amount of time. There was also a control group which did not receive a special program. After four months, all three groups improved on the Perceptual-Motor Survey, and the experimental group and Hawthorne group improved on intelligence scores.

Godfrey, Barbara and Kephart, Newell C. *Movement Patterns and Motor Education*. New York: Appleton-Century-Crofts, 1969.

Applies Kephart's theory to physical education and movement education.

Haring, Norris and Stables, Jeanne. The effect of gross motor development on visual perception and eye-hand co-ordination. *Physical Therapy* 46 (1966): 129-135.

Investigates Kephart's closed-cycle theory, the notion that an organism's input-output functions occur in a closed cycle in which perceptual and motor activities work together in one process, not in two separate processes. The experiment included 24 mentally retarded children either in a primary, intermediate, or junior high class. The 12 children in the experimental group were given the Purdue Perceptual-Motor Survey, and a seven-month training program was constructed in the areas of greatest deficiency. At the end of the training period, the experimental group improved more than the control group on tests of visual perception and eye-hand motor coordination.

Johnson, G. Orville. Review of the month. *Rehabilitation Literature* 22 (1961): 10-11.

Reviews *The Slow Learner* by Newell C. Kephart. Describes the book as lacking a good definition of the slow learner or special student. Discusses the theory as being based on assumptions, particularly dealing with perception, that have no research verification.

Kaluger, George and Kolson, Clifford. *Reading and Learning*. Columbus, Ohio: Charles Merrill Publishing Co., 1969.

Reviews the methods of teaching the disabled reader.

Kephart, Newell C. *The Brain-Injured Child in the Classroom*. Chicago: National Society for Cripple Children and Adults, 1963.

Presents a brief description of Kephart's theory.

Kephart, Newell C. *Learning Disability — An Educational Adventure*. West Lafayette, Ind.: Kappa Delta Pi Press, 1968.

Presents Kephart's theory concerning the treatment of learning disabilities.

Kephart, Newell C. Perceptual-motor aspects of learning disabilities. *Exceptional Children* 31 (1964): 201-206.

Explains Kephart's perceptual-motor theory in relation to classroom learning experiences. Discusses the child's interaction with his environment through the use of these motor generalizations: balance and maintenance of posture, locomotion, receipt and propulsion, and contact. Explains how directionality is developed from these motor generalizations.

Kephart, Newell C. *The Slow Learner in the Classroom.* Columbus, Ohio: Charles E. Merrill Books, 1960.

Basic reference for Kephart's perceptual-motor theory.

Kohen, Raz Reuven. *Developmental Patterns of Static Balance Ability, and their Relation to Cognitive School Readiness.* Stanford, Calif.: Stanford School of Medicine, 1969. (Educational Resources Information Center, U.S. Office of Education, 400 Maryland Ave., S.W., Washington, D.C., ED 036 039, Microfiche)

Static balance was assessed in 239 children between five and nine years old using electronic atusiametry. This measure of static balance ability was related to the teacher's evaluation of school preparedness, basic math skills, and reading achievement. Complete description of the experiment is included.

Maloney, Michael P.; Ball, Thomas S.; and Edgar, Clara L. Analysis of the generalizability of sensory-motor training. *American Journal of Mental Deficiency* 74 (1970): 458-474.

Investigates the generalizability of Kephart's sensory-motor training system. Fifty-nine moderately or severely retarded institutionalized males were assigned to one of three groups: sensory-motor training group, attention-comparison group, and traditional no-treatment control group. The sensory-motor group was given a two-month program of activities suggested by Kephart, and the attention-comparison group was given a two-month program of sedentary activities involving the same amount of interpersonal interaction and physical contact with the experimenter as the sensory-motor training. Sensory-motor training generalized to body image development, but not to finger localization skill.

McCormick, Clarence C. and Schnobrich, Janice. The effect of perceptual-motor training on reading achievement. *Academic Therapy* 4 (1969): 171-176.

Investigates the effect of perceptual-motor training on reading achievement. First-grade students were assigned to either an experimental or control group. The experimental group received a nine-week training program which was not completely described. After nine weeks, only in the lower 30 percent of the class were there any reading differences between the experimental and control groups.

Moore, A. Henry and Brinning, Dorothy. *Activities for a Perceptual-Motor Program.* Washington, D.C.: Educational Resources Information Center, U.S. Office of Education, n.d. (ED 039 675, Microfiche).

Presents perceptual-motor activities for physically handicapped children. Includes fine and gross motor activities and methods to develop body image, visual-motor skills, tactile perception, and auditory perception. The activities are similar to those recommended by Kephart.

O'Connor, C. Effects of selected physical activities upon motor performance, perceptual performance, and academic achievement of first graders. *Perceptual and Motor Skills* 29 (1969): 703-709.

Compares the effects of two training programs, traditional physical education activities and activities suggested by Kephart. The training program was six months long and included 123 children. After the training program, the children who were enrolled in the Kephart training program performed better on measures of motor ability and lateral awareness. This research should be interpreted cautiously since the teacher ratio was 10 to 1 for the Kephart group, and 30 to 1 for the traditional group.

Portland Public Schools. Individualized Motor-Perceptual Study. Washington, D.C.: Education Resources Information Center, U.S. Office of Education, n.d. (ED 029 692, Microfiche).

This complete curriculum guide for perceptual-motor activities for kindergarten children includes tips for teaching, beginning activities, an appendix defining terminology used in the curriculum, a bibliography, teacher checklists, and suggested tape recordings. For each activity the following are explained: objective, general purpose, materials, directions for teachers, suggested directions to children, and variations of the activity.

Roach, Eugene G. and Kephart, Newell C. The Purdue Perceptual-Motor Survey. Columbus, Ohio: Charles E. Merrill Publishing Co., 1966.

Describes a test to detect errors in perceptual-motor development.

Roger, Agnes L. Incorporating Frostig and Kephart Principles in a Curriculum for Mentally Handicapped. Washington, D.C.: Educational Resources Information Center, U.S. Office of Education, n.d. (ED 028 758, Microfiche).

Explains how the Frostig and Kephart principles can be incorporated into classroom experiences of mentally handicapped children.

Sensory-motor perception: Preliminary findings of a co-operative curriculum project. (Washington, D.C.: Education Resources Information Center, U.S. Office of Education, n.d., ED 023 552, Microfiche).

Describes tasks to be included in the following parts of a curriculum for sensory-motor perception: motor development, body image, visual-motor perception, auditory perception, and tactile discrimination. The learning tasks are similar to those recommended by Kephart.

Strauss, Alfred A. and Kephart, Newell C. Psychopathology and Education of the Brain-Injured Child. vol. 2. New York: Grune & Stratton, 1947.

Explains the theory of Strauss and Kephart concerning the problems, testing, and education of the brain-injured child.

Strauss, Alfred A. and Lehtinen, Laura E. Psychopathology and Education of the Brain-Injured Child. vol. 1. New York: Grune & Stratton, 1947.

Part II | Bibliography,
by Subject

Bibliography on || Auditory Perception
|| and Movement

GENERAL

Alpern, Mathew; Lawrence, Merle; and Walsk, David. *Sensory Processes*. Belmont, Calif.: Brooks Cole Publishing Co., 1967.

Presents the physical and perceptual aspects of hearing using illustrations and limited technical terminology.

Bilodeau, Edward A. Supplementary feedback and instructions. In *Principles of Skill Acquisition*, edited by E. A. Bilodeau, pp. 235-253. New York: Academic Press, 1969.

Reviews research literature relating to the feedback of verbal instructions to the performer. The bibliography includes over 45 references.

Dember, William. *Psychology of Perception*. New York: Holt, Rinehart & Winston, 1965.

Discusses the relationship of vision to audition.

Howard, I. P. and Templeton, W. B. *Human Spatial Orientation*. New York: John Wiley & Sons, 1966.

Chapter VI. Auditory localization. Explains auditory localization and experimental design and research instruments. Discusses the sensitivity of auditory localization of adults, including the effect of constant errors in auditory localization. Includes the effects of vision on auditory localization and the localization of multiple auditory signals.

Kidd, Aline H. and Kidd, Robert M. The development of auditory perception in children. In *Perceptual Development in Children*, edited by A. H. Kidd and J. L. Rivoire, pp. 113-143. New York: International Universities Press, 1966.

Includes experimental studies involving prenatal and infant research. Reviews auditory perception studies using selected intensity, pitch, or timbre variables.

Mueller, Conrad G. *Sensory Psychology*. Englewood Cliffs, N.J.: Prentice-Hall, 1965.

An introductory book explaining the nature of the auditory senses.

Pick, Herbert L. and Pick, Anne D. Sensory and perceptual development. In Carmichael's *Manual of Child Psychology*, edited by P. Mussen, vol. 1. New York: John Wiley & Sons, 1970.

Includes the development of auditory sensitivity in young children.

Reese, Hayne and Lipsitt, Lewis. *Experimental Child Psychology*. New York: Academic Press, 1970.

Chapter II. Sensory processes. Reviews the development of auditory perception including amplitude, frequency, and localization research.

Spears, William C. and Hohle, Raymond H. Sensory and perceptual processes in infants. In *Infancy and Early Childhood*, edited by Y. Brackbill, pp. 123-203. New York: Free Press, 1967.

Explains the physical development of the audition system of the infant.

Stevens, S. S.; Warshofsky, Fred; and the Editors of Life. *Sound and Hearing*. New York: Time Incorporated, 1965.

Uses picture essays to explain the auditory system. Includes an excellent explanation of the anatomy of the ear.

RESEARCH

Boggs, David H. and Simon, J. Richard. Differential effect of noise on tasks of varying complexity. *Journal of Applied Psychology* 52 (1968): 148-153.

Noise produced a decrement in performance. The magnitude of this decrement depended upon the task complexity.

Breen, W. W.; DeHaemer, M. J.; and Fooock, G. K. Comparison of the effect of auditory versus visual stimulation of information capacity of discrete motor response. *Journal of Experimental Psychology* 82 (1969): 395-397.

Investigates the effect of auditory and visual stimulation on reaction time and movement time of a discrete motor response. During auditory

stimulation, the subject moved a metal stylus to a left or right target, the movement direction depended upon the pitch (low or high) of the tone. During visual stimulation, a light stimulus indicated the movement direction. An index of difficulty was defined by a formula which included the width of the target and the distance between the two targets. Reaction time was shorter for the visual stimulus. Movement time was affected by changes in the index of difficulty, and not the modality of the stimulus.

Catalano, John F. and Whalen, Patricia M. Effects of auditory stimulation upon decrement and reminiscence in rotary pursuit tracking. *Perceptual and Motor Skills* 25 (1967): 981-988.

Two separate experiments examined the effect of auditory stimulation on rotary pursuit tracking performance. In the first experiment, the subjects performed the task with either no feedback, or auditory feedback using a buzzer at two different intensities. No performance differences were found among the three conditions. In the second experiment, borderline differences were found.

Colgate, Thomas P. Reaction and response times of individuals reacting to auditory, visual, and tactile stimuli. *Research Quarterly* 39 (1968): 783-784.

The subject responded to three stimuli: a light, a door bell, and an electric shock. The subject was not told in advance which stimulus he would receive. The quickest reaction time was for the auditory stimulus, and the slowest reaction time was for the tactile stimulus. The response time was quickest for the auditory stimuli and slowest for the tactile. All differences were significant according to the *t* test. No review of literature or bibliography was included.

Cooper, Walter Elmore. Videotape replay feedback in learning selected gross motor skills. *Dissertation Abstracts* 30 (1970): 3775A-3776A.

The subjects, seventh grade boys, were assigned to one of five feedback treatments: (1) auditory feedback, (2) videotape feedback, (3) combined auditory and videotape feedback, (4) no feedback from instructor, and (5) control group. The experimental groups received instruction for four basketball skills: dribbling, lay-up shots, passing and catching, and one-hand push shots. The type of feedback did not affect lay-up performance on the Knox Wall Bounce Test. Videotape feedback affected the push shot and the dribble. The auditory and videotape group improved on the Johnson Motor Battery.

Cotton, Patricia. Instructions given by different voice intensities, and frequencies and gross motor performance. Master's thesis, Purdue University, 1969.

Verbal instructions of different intensities and frequencies were used to describe a motor task, which was a 37½-yard run with two sharp curves. No movement time differences were found for the combinations of intensities and frequencies included in the study.

Fisher, Gerald H. Agreement between the spatial senses. *Perceptual and Motor Skills* 26 (1968): 849-850.

The subjects judged the relative positions of two stimuli from two different modalities. The following modalities were paired: visual and tactile, tactile and auditory, and auditory and visual. Constant errors were found which implied that agreement between the spatial sense is apparent rather than accurate.

Huff, Joan. An investigation of auditory and visual perception of rhythm and its relation to skill in selected motor activities. *Dissertation Abstracts* 28 (1967): 1281-1282.

The subjects were given the Seashore Measures of Musical Talents Test for the auditory perception measure. Visual perception was measured using the same test with a flashing light. Motor performance was measured from the performance of a gross motor sequence using rhythms presented in the visual and auditory modalities. No auditory and visual perceptual differences were found among dancers, athletes, and less specialized subjects. Dancers were most accurate in the auditory motor performance, and tennis players were most accurate in the visual motor performance. No sex differences were found.

Kohfeld, David L. Effects of intensity of auditory and visual ready signals on simple reaction time. *Journal of Experimental Psychology* 82 (1969): 83-95.

Three intensities of sound or light were used to present two stimuli, either 15 or 1.5 seconds apart. One was a "ready" signal, and the other one was "response" signal. The motor task involved a telegraph key. Reaction time increased as the intensity of the ready signal increased.

Kriebel, Eugenia Sue Scott. The effects of reducing, masking, and/or delaying the auditory cues inherent in a task on the performance of that task. Masters thesis, Purdue University, 1970.

Investigates the importance of auditory cues to the performance of a gross motor task, striking a ping pong ball against a backboard. Time and accuracy scores were examined with normal conditions. The subjects' performance was not affected by reducing, masking, or delaying the auditory cues.

Lloyd, John R. The effect of audio and visual feedback on the learning of a gross motor skill when imposed at selected stages of a learning period. *Dissertation Abstracts* 29 (1969): 2987.

Slow-motion films of the performers taken at selected stages during a 16-week tennis class, and shown as feedback did not improve forehand and backhand strokes in tennis except in the case of ground strokes for those classified as beginners.

Meichenbaum, Donald. Reflection-impulsivity and verbal control of motor behavior. *Child Development* 40 (1967): 785-787.

This study compares the use of verbal control words to self-instruction on a motor task performed by kindergarten children. "Faster" and "slower" were the verbal control words for a finger tapping response, and "push" and "don't push" were the verbal control words on a foot depression task. Kagen's Matching Familiar Figures Test was used to classify the children according to reflection-impulsivity.

Mostotsky, David and Noyes, Marianne. Attentional factors in delayed vocal auditory feedback effects on concurrent motor tasks. *Journal of Auditory Research* 9 (1969): 51-56.

The subject read a standard passage and recited a nursery rhyme under three motor conditions: (1) while tapping a silent key at the rate of two taps per second, (2) while tapping a silent key at the rate of two taps per second which served to illuminate a darkened room, and (3) with no concurrent motor task. All three motor conditions were performed with immediate and delayed (.16 seconds) binaural feedback. The motor task performance deteriorated during the delayed feedback of verbal material being read or recited.

Petzold, Robert G. Auditory perception by children. *Journal of Research in Music Education* 17 (1964): 82-87.

Rapin, Isabelle et al. Effects of varying delays in auditory feedback on keytapping of children. *Perceptual and Motor Skills* 16 (1963): 489-500.

Children, 6 to 11 years old, tapped a key in groups of three taps with a click as immediate and delayed feedback. The force of the taps, the total time for 30 taps, and the amount of time the finger rested on the key were recorded. Force increased when the feedback was delayed. The amount of increase was not affected by the amount of delay. Delayed feedback disrupted key tapping and total time.

Rapin, I. et al. Key tapping and delayed feedback. *Journal of Speech and Hearing Research* 9 (1966): 278-288.

Normal and deaf children tapped a key in groups of three taps with a click or flash as immediate or delayed feedback. Delayed feedback with flashes disrupted 72 percent of the normal children's performance. No differences between immediate feedback were found for peripherally deaf children. Disrupted performance for children was an increase in force of taps, a decrease in the rate of tapping, and errors in grouping.

Simon, J. Richard. Reaction time as a function of the cue properties of an auditory display. *Journal of Applied Psychology* 52 (1968): 224-226.

The subject pressed a right or left key according to binaural commands, monaural commands, or monaural pure tones. The slowest responses were to binaural commands and the fastest responses were to monaural tones.

Thomas, Edward J. The latency of motor reactions to auditory stimuli as a function of stimulus intensity and duration. *Dissertation Abstracts* 27 (1967): 4151B-4152B.

Reaction time was inversely related to stimulus duration when the intensity was above 10 db. When the intensity was below 10 db., the reaction time was independent of stimulus duration.

Usher, George Harvey. A study of different methods of teaching a motor skill employing visual materials. *Dissertation Abstracts* 31 (1971): 3942A.

Four types of feedback were given to fourth graders while they were learning to head a ball through a doorway: (1) videotape replay with teacher instruction, (2) videotape replay without teacher instruction, (3) motion picture replay with teacher instruction, and (4) teacher instruction with no replay. The criterion performance was a group mean of 80 percent success and only the group experiencing videotape replay and teacher instruction reached this criterion.

Bibliography on || Body Image || and Movement

INTRODUCTION

The performer's accurate estimation of his body image may be an important consideration in successful and efficient movement. Movement performers must estimate the height and width of their total body and/or body parts in order to make decisions about their movement through an environment of static and dynamic objects and people. It may be that accurate estimation of body image is a prerequisite for skilled movement performances.

RESEARCH

Alvarez, Jean. Body width estimations by six-year-old boys under static and dynamic conditions. Masters thesis, Purdue University, 1968.

Each of the subjects, six-year-old boys, made estimations with regard to the size of the door he could fit through under static and dynamic movement conditions. During the static conditions each subject pointed to the door width he judged he could fit through, and during the dynamic condition each subject ran to the door size he thought he could fit through. The door width estimates of the smallest size door were larger when the estimate was made in the dynamic condition.

Andrews, Joseph Karl. The relationship of body image to verbal learning and perceptual motor ability in young children. *Dissertation Abstracts* 29 (1969): 4373B.

No relationship was found between body image and the Bender Gestalt Test of Visual Perception for young elementary children. A "body prominence score" was not related to the rate which a series of body words was learned, as compared to a series of non-body words.

Armstrong, Herbert E., Jr. and Armstrong, Dollie C. Relation of physical fitness to a dimension of body image. *Perceptual and Motor Skills* 26 (1968): 1173-1174.

A positive relationship was found between body image barrier scores and the New York State Physical Fitness Test for adolescent girls. No relationship was found between these variables for boys.

Cappon, Daniel and Banks, Robin. Distorted body perception in obesity. *Journal of Nervous and Mental Disease* 146 (1968): 465-467.

The body image of obese (mean weight 187 pounds) and normal (mean weight 133 pounds) adults was compared. Body width and depth were estimated during two conditions: in a dark room and looking into a mirror. The obese adults made greater body width and depth estimation errors than the normal adults.

Cremer, Alma G. and Hukill, Margaret B. Relationships between weight-height ratios, other body measurements, and self-perception of body contours. *Research Quarterly* 40 (1969): 30-38.

The findings of this study indicate that the greater the deviation in weight is from that considered desirable in terms of height and age, the greater is the difference between perceived body contour lines and real ones.

Dillon, Donald J. Estimation of bodily dimensions. *Perceptual and Motor Skills* 14 (1962): 219-221.

Ascending and descending estimates were given for five vertical dimensions (height to knee, hip, shoulder, mouth, and full height) and four horizontal dimensions (width of head and body, depth of body, and length of arm held horizontally). Descending estimations were greater for six of nine dimensions. Except for knee height estimates, the ascending estimations did not differ from the physical measures. Five descending height measurements were greater than physical measures. The descending horizontal measures were not greater than physical measures. Ascending estimates are when the subject is asked to move the beams closer together until the separation equals the size of body part being estimated. Descending estimates are when the subject is asked to move the beams farther apart until the separation equals the size of the body part being estimated.

Dillon, Donald J. Measurement of perceived body size. *Perceptual and Motor Skills* 14 (1962): 191-196.

Ascending and descending estimates were given for body width, height, and depth measurements. Descending width, depth, and height estimates were greater than ascending estimations. Descending estimates were greater than the physical dimensions of height and depth, while ascending estimates were not.

Elbaum, Isabel. Body image and motor development. Completed Research in Health, Physical Education, and Recreation 7 (1965): 43.

High correlations (.84 and .93) were found between motor development and body image of boys and girls between six and seven years old.

Fulton, Gene Burke. A study of the relationship of body image to selected physical abilities — A phenomenological approach to analysis and modification. Dissertation Abstracts 28 (1968): 3486A.

Investigated the effect of a 12-week physical education program on self-concept and body image of college males. Both the control group and the experimental group improved on an eight-item physical performance test, and the body image and self-concept scores remained the same.

Furher, M. J. and Cowan, C. O. Influence of active movement, illumination, and sex on body part estimates. Perceptual and Motor Skills 24 (1967): 979-985.

Body-part estimates and non-body object estimates were examined during moving and immobile conditions. A greater magnitude of underestimation was found during non-movement and darkened conditions.

Greenlee, Joy C. The estimation of body height, object height, and motor performance of six-year-old boys. Master's thesis, Purdue University, 1967.

Estimates of standing, kneeling, and sitting heights by six-year-old boys were more accurate than their estimates of performance on the jump and reach test.

Hart, Barbara. Comparison of actual and self estimated body width of seven-year-old boys under static and dynamic conditions. Master's thesis, Purdue University, 1969.

First grade boys estimated the width of a door to be equal to their shoulder width under two conditions: static (standing) and dynamic (running on a treadmill). Body sway was determined by the analysis of the film taken while the boys were running on the treadmill. Both the static and dynamic estimates of door width were larger than the shoulder width of the boys. The dynamic and static estimates were not different. No relationship was found between body sway and the difference between the dynamic and static estimates.

Hester, Gene A. Effects of active movement on body-part size estimates. Perceptual and Motor Skills 30 (1970): 607-613.

Body-size estimates by college males were examined during three conditions: (1) active movement of a joint-bounded body part prior to estimation of body parts, (2) active movement of a joint-bounded and non-joint

bounded body part prior to estimation of body parts and non-body parts, and (3) no movement of a joint-bounded or non-joint-bounded body part prior to estimation of body parts and non-body parts. The findings of this study were inconsistent with the findings of Fuhrer and Cowan (1967), which indicated that active movement produces proprioceptive cues which enhance one's ability to make size judgments of body parts.

Leahy, Robert F. A study of the relationship between certain objective measures of body image and a measure of motor performance on the stabilometer. Completed Research in Health, Physical Education, and Recreation 9 (1967): 73.

No relationship was found between body image and motor performance on a stabilometer for college males.

McFee, Wilhelmina D. The relationship between body image boundaries, estimates of dimensions of body space, and performance of selected gross motor tasks in late adolescent subjects. Completed Research in Health, Physical Education, and Recreation 12 (1970): 170-171.

The findings of this study indicated that subjects with a well-articulated body image might be able to better manipulate the body and other objects.

Nash, Harbey. The judgment of body landmark heights. Genetic Psychology Monographs 79 (1969): 251-296.

Estimates of heights of selected body landmarks along the cephalocaudal axis were examined with subjects varying in age, sex, and anatomical training. The subjects underestimated the heights of the crotch and the navel. Estimates of eye and bottom of the nose heights relative to head height were overestimated. Determinants of the subjects' distorted images of the body were discussed.

Robertson, Patricia Ann. Evaluation of instruments to determine body image. Completed Research in Health, Physical Education, and Recreation 12 (1970): 259.

Three methods of determining body image were used on female college students: a rating scale check sheet, a figure construction test, and photography of frontal and lateral views of the body. A wide variation was found in accuracy when the subjects estimated the size of their body segments.

Schontz, Franklin C. Estimation of distances on the body. Perceptual and Motor Skills 24 (1967): 1131-1142.

Combinations of body parts, judged as a unit, were underestimated relative to estimates of component body parts judged separately.

Werner, H.; Wapner, S.; and Comalli, P. E. Perceptual and Motor Skills 7 (1957): 69-71.

The subject, with his eyes closed, estimated his own head size by pointing with his fingers. The examiner touched the temples of the experimental group while the subject made the judgment. The examiner did not touch the control group. Perceived head width was overestimated, and this overestimation decreased while the head was touched.

Woods, Marcella Darlene. An exploration of development relationships between children's body image boundaries, estimates of dimensions of body space, and performance of selected gross motor tasks. Dissertation Abstracts 27 (1967): 4119A.

The following measures were taken on boys and girls aged 8, 10, and 12 years: barrier score, estimates of dimensions in body space, actual dimensions in space, and performance of these three motor tasks: catching-throwing, target jump, and shuttle run. The relationship between these measures was examined.

Bibliography on | Depth and
| Distance Perception
| and Movement

INTRODUCTION

The performer's accurate estimate of depth and distance in his environment may be a consideration in successful and efficient movement. Movement performers must estimate the length, depth, and distance of many stationary and moving objects. It may be that accurate distance and depth perception is a prerequisite for skilled movement performances.

GENERAL

Epstein, William. *Varieties of Perceptual Learning*. New York: McGraw-Hill Book Co., 1967.

Chapter II. The assumption contest: The perception of size and distance. Reviews research literature related to the perception of size and distance. The bibliography includes over 45 references.

Gibson, James. *The Perception of the Visual World*. Boston: Houghton Mifflin Co., 1950.

Chapter VII. Stimulus variables for visual depth and distance — The active observer. Explains the visual cues used for depth and distance perception.

Gogel, W. C. Size cue to visually perceived distance. *Psychological Bulletin* 62 (1964): 217-235.

Presents an excellent review of literature on the effect of two kinds of size cues, relative size and familiar size, on distance perception.

Graham, Clarence H. Visual space perception. In *Vision and Visual Space Perception*, edited by C. H. Graham. New York: John Wiley & Sons, 1966.

Explains the monocular visual space cues (interposition, linear perspective, aerial perspective, monocular movement, parallax, light and shade, accommodation) and the binocular cues (convergence, stereoscopic vision). Explains the concept of visual angle. The bibliography includes over 100 references.

Ittelson, William H. *Visual Space Perception*. New York: Springer Publishing Co., 1960.

Chapter IV. Visual cues, equivalent configurations, the invariance hypothesis. Provides a classification and explains the function of the visual space cues. Defines the concept of equivalent configurations. Explains the size-distance invariance hypothesis.

Chapter V. Size, shape, perspective. Discusses the visual space cues relating to these topics: absolute size as a cue to absolute distance, relative size as a cue to relative distance, changing size as a cue to radial motion, and apparent size and size constancy.

Chapter VI. Movement parallax, overlay, and togetherness cues. Explains movement parallax.

Chapter VII. Binocular stereopsis. Explains binocular stereopsis visual space cues.

Chapter VIII. Accommodation and convergence. Explains these experimental variables: apparent distance, actual conditions of accommodation and convergence, and physical distance of the object. Discusses accommodation and convergence as cues to distance.

RESEARCH

Agnew, N. M.; Pyke, Sandra; and Pylyshyn, Z. W. Absolute judgment of distance as a function of induced muscle tension, exposure, time, and feedback. *Journal of Experimental Psychology* 7 (1966): 649-654.

Subjects were asked to estimate the distance separating two dots of light. Before the presentation of each slide, the subject either squeezed a hand dynamometer mildly or strongly. The exposure time for the presentation of the two dots was either 10 msec. or one second. Only part of the subjects were given feedback after each trial on the accuracy of their estimations. Errors in estimation of distance were reduced by induced tension, longer exposure, and feedback. The facilitative effects of induced muscle tension were less pronounced under long exposures and feedback conditions. This induced muscle tension prior to the visual presentation may be conceived as serving as a general alerting function.

Coltheart, Max. The influence of haptic size information upon visual judgments of absolute distance. *Perception and Psychophysics* 5 (1969): 143-144.

The subject estimated the distance between him and a four- or eight-inch triangle while holding a four- or eight-inch triangle in his hand. The examiner told the subject that the triangle he was holding was equal in size to the triangle used for distance estimation (this was sometimes untrue, the triangle being larger or smaller). When the retinal size of the estimated triangle was held constant, the judged distance increased as the size indicated by a haptic comparison object increased. When the haptically-indicated size was held constant, the judged distance decreased as the retinal size increased.

Corsini, David A. The effect of texture on tactually perceived length. *Perception and Psychophysics* 5 (1969): 352-356.

Blindfolded subjects judged the length of two stimuli with different textures. Fine-textured stimuli were judged as longer than coarse-textured stimuli. Implications for constructing teaching materials for the blind are discussed.

Dickinson, J. The role of two factors in a gross motor aiming task. *British Journal of Psychology* 60 (1969): 465-470.

The relationship between two tests, kinesthetic sensitivity and depth perception, and performance of novices on a badminton skill was investigated. A relationship was found between kinesthetic sensitivity and a badminton aiming skill. No relationship was found between depth perception and this badminton skill.

Dunn, Bruce E. Relative distance of lights: An extension of Bugelski's finds. *Perception and Psychophysics* 6 (1969): 414-415.

The subject adjusted three lights until they appeared to be equal distances apart. Horizontal separation between the lights did not affect depth settings, but higher lights were perceived as closer.

Epstein, William. Perceived depth as a function of relative height under three background conditions. *Journal of Experimental Psychology* 72 (1966): 335-338.

The subject made a verbal estimation of the depth between two points. As the depth between the points increased when the background was outlined and textured, the estimated depth increased. The estimated distance increased as the background became more complex.

Epstein, William. Size and distance conditions under reduced conditions of viewing. *Perception and Psychophysics* 6 (1969): 269-272.

Distance estimations were made during three viewing conditions: physical size and distance variant with visual angle of the variable constant and

equal to the standard; physical size constant with physical distance and visual angle changing; and physical distance constant with physical size and visual angle changing. Variables with smaller visual angles than the standard were estimated as more distant and smaller. These two statements were only consistent for conditions one and two.

Gogel, W. C. The absolute and relative size cue to distance. *American Journal of Psychology* 82 (1969): 228-234.

The subject viewed two sizes of playing cards 10 feet away. One card was normal size and one card was twice as large, simulating the retinal image of a normal size card 5 feet away from the subject. If familiar size determined perceived size, the normal and large cards should be reported to be the same width. This was not the case, the large card was reported as being larger than the small card, but not twice as large. If retinal size determined perceived size, the width of the large card should have been reported to be twice as great as the small card. The perceived width of the small card was 1.6 inches and the perceived width of the large card was 2.3 inches. This does not completely support either theory of perceived size.

Gogel, W. C. and Mertens, Henry W. Perceived depth between familiar objects. *Journal of Experimental Psychology* 77 (1968): 206-211.

Five familiar objects (a box of cough drops, a half-dollar, a tape dispenser, a door key, and a tube of toothpaste) were simulated and presented in pairs. The subject estimated the distance between him and the object and the distance between each object in the pair. The ratio of estimated size to retinal size affected the estimation of distance. The objects having the largest value of this ratio were perceived as more distant. The perceived depth between objects was a monotonic function of the differences in the value of this ratio.

Gogel, W. C. and Mertens, H. W. Perceived size and distance of familiar objects. *Perceptual and Motor Skills* 25 (1967): 213-225.

This study investigated perceived distance of a playing card in relation to the projected size of the visual image on the retina. Both stationary and moving stimuli were investigated. Perceived depth between cards could not be totally explained in terms of the projected size of the retinal image since this was a highly variable determiner of perceived distance.

Haraway, Norman I. Judgment of distance in children and adults. *Journal of Experimental Psychology* 65 (1963): 385-390.

The subjects between the ages of 4 and 30 directed the adjustment of two pointers until the distance between them was estimated to be equal to a standard distance. The subjects made their distance estimations from two heights: normal standing height and standing on an adjustable platform that equated the height of all subjects. All age groups in both height conditions overestimated the length of one foot on the pointer at all distances. The height from which the subject made judgments did not influence the estimation of

distance. When this task was repeated, all age groups, except the adults, estimated the distances more accurately. There was a large decrease in estimation errors between the 10- and 12-year-olds.

Haraway, Norman I. and Haraway, Vivian T. Accurate distance judgments in children. *Perceptual and Motor Skills* 17 (1963): 941-942.

The subjects, seven-year-old children, directed the adjustment of two pointers until the distance between them was estimated to be equal to a standard distance. The distance between the subject and the pointer was varied. The subjects were given a spatial relations, figure-ground, form constancy, visual-motor sequencing, and maze test. The accuracy of the distance estimations was not related to measures of spatial relations, perceptual tasks, or intelligence.

Kinney, J. A.; Luria, S. M.; and Weitzman, Donald. Effect of turbidity on judgments of distance underwater. *Perceptual and Motor Skills* 28 (1969): 331-333.

Each subject looked into an underwater window of a swimming pool and estimated the number of standard units between him and the target. The standard unit was determined by the distance (two feet) between him and the standard target which was not submerged. The subjects made distance estimations during two water conditions, clear and turbid. The distance estimates, when the physical distance between the subject and the target was between 4 and 25 feet, were overestimated. When the physical distance between the subject and target was between 2 and 3 feet, the distance was underestimated. When the water was turbid, the overestimations between 4 and 25 feet were greater.

Kinney, J. A.; Luria, S. M.; and Weitzman, Donald. Responses to the underwater distortions of visual stimuli. U.S. Naval Submarine Medical Center Report, no. 541, 1968.

The results of underwater experiments on size and distance perception and hand-eye coordination indicated that the accuracy of distance estimates underwater varies greatly from underestimation at near distances to overestimation at far distances. Viewing through turbid rather than clear water greatly increases the tendency toward overestimation. The ability to perform a motor response adequately underwater varied with the amount of time spent underwater.

Luria, S. M. and Kinney, J. A. Judgments of distance under partially reduced cues. *Perceptual and Motor Skills* 26 (1968): 1019-1028.

Judgments of the distance between the observer and four-inch square targets were obtained in three environments: well-lighted everyday surroundings, the middle of a large gymnasium, and under almost completely reduced cues. Adults were able to estimate distances accurately in the middle of a gymnasium and under almost completely reduced cues. With a white surrounding, low contrast distant targets were judged to be farther away, and high contrast nearby

targets were judged to be farther away. Less variability was found for the black surrounding.

Luria, S. M.; Kinney, J. A.; and Weissman, Seymour. Distance estimates with filled and unfilled space. *Perceptual and Motor Skills* 24 (1967): 1007-1010.

The subjects judged distances between them and the target by comparing this distance to the distance of a standard target. During the "unfilled" space condition, there was nothing between the subject and the standard target. For the "filled" space condition, a chromium steel rod with a .25-inch diameter extended between the subject and the standard target six inches below eye level. During the "filled" condition, smaller estimates of distance were given for both monocular and binocular viewing. In binocular viewing, overestimation and underestimation depended on the distance of the comparison target.

Luria, S. M.; Kinney, J. A.; and Weissman, Seymour. Estimates of size and distance underwater. *American Journal of Psychology* 80 (1967): 282-286.

The subjects judged the distance between them and the target through an underwater porthole. The same distances were also estimated on land. The distances were overestimated in water as compared to estimates in air, and these overestimates increased with distance.

Mail, Patricia P. Influence of binocular depth perception in the learning of a motor skill. *Research Relating to Health, Physical Education and Recreation* 8 (1966): 90.

Some aspects of depth perception as measured by the Keystone View Ophthalmic Telebinocular, Titmus Stereo Circles Test, Modified Howar-Dolman Test, and the American Automobile Association Distance Judgment Test were related to proficiency in learning tennis.

Over, Ray. Size and distance-estimate of a single stimulus under different viewing conditions. *American Journal of Psychology* 76 (1963): 452-457.

Distance estimates were made during two viewing conditions, unrestricted and reduced. Reduced conditions were a darkened room, monocular viewing, and unrestricted head movement. The subjects underestimated the distance of 20 and 30 feet during both viewing conditions.

Redding, Gordon M.; Mefferd, Roy B.; and Wieland, Betty. Effect of observer movement on monocular depth perception. *Perceptual and Motor Skills* 24 (1967): 725-726.

The subjects adjusted the depth of a thin, luminous comparison rod to that of a standard rod. The rods were either both vertical, slanted 45 degrees, or

one vertical and one slanted. Part of the subjects could sway only their heads, and others could sway from their waists. The subjects who could sway from their waists made more accurate depth judgments.

Ross, Helen E. Water, fog, and the size-distance invariance hypothesis. *British Journal of Psychology* 108 (1967): 301-313.

Divers were required to make distance judgments on land and in the water. Disk size did not affect distance judgments on land, but the underwater judgments of distance beyond 30 feet were systematically influenced by the relative size of the disk, the smaller of the two disks at the same distance was judged as farther away. Distances estimated in fog were twice as great as distances estimated in clear weather.

Schrader, Charles W. The effect of differences of five aspects of vision on hand-eye coordination performances. *Dissertation Abstracts* 29 (1969): 2552-2554.

Eye-hand coordination scores were obtained from the Koerth rotary pursuit apparatus. Also obtained were five visual performances: depth perception, ocular muscle balance, retinal rivalry rate, and the size of the visual fields. Depth perception was an unimportant factor in the performance of this motor task.

Smith, O. W. and Smith, P. C. Developmental studies of spatial judgments by children and adults. *Perceptual and Motor Skills* 22 (1966): 3-73.

I. Some dimensions of space perception. A factor analysis of 40 perceptual tasks involving judgments of size, distance, motion, visual direction, curvature, and body size showed the factor structure of children and adults to be remarkably similar.

II. Aptitudes and the self as bases for theory of size-distance perception. Eleven of the 40 tasks used in Part I were analyzed separately. These tasks involved judgment of size and distance under the following three reduced conditions: no cues for distance using a test object of unknown size; monocular view with only the head as the principle cue for distance; and monocular view of a familiar object (a baseball). The results indicated that the basic cues for distance are dependent upon the subject's body dimensions and his capacity for spatial performance. Judgments of size and distance did not correlate, indicating that different cues may be functional for size and distance judgments.

III. Familiar size as a cue for judgments of size and distance. The subjects — children and adults — monocularly viewed a baseball and estimated its distance. Then, they viewed the baseball again. This same sequence was repeated, but a black dot was viewed instead of a baseball. The sequence was repeated again with the baseball and binocular vision. Both adults and children overestimated the distance of the ball during both binocular and monocular conditions. The children made their monocular judgments using either "physical size" or "visual angle" cues, while adults made no "visual angle" matches.

IV. Comparison of binocular and monocular perceived depths. The subject viewed a small ball 20 feet away with his right eye only, and then viewed

a set of small, multi-shaped, multi-colored objects, and selected an object which was equal to the distance between him and the ball. No differences in monocular and binocular perceived depths were found.

Tergersen, Ruth L. The relationship of selected measures of wrist strength, vision, and general motor ability to badminton playing ability. Completed Research in Health, Physical Education, and Recreation 7 (1965): 77-78.

Badminton play ability was correlated with depth perception as measured with the Howard-Dolman apparatus. The highest and lowest six players differed in depth perception.

Wohlwill, Joachim F. Overconstancy in distance perception as a function of stimulus field and other variables. Perceptual and Motor Skills 17 (1963): 831-846.

The subject looked monocularly into a viewing box and could see three markers of different distances from him. He made a bisection judgment (located at a point halfway between the pairs of markers) by moving a pointer. The floor panel of the viewing box was either black or white, or had variable densities of black stars on a white background. Overconstancy (when subject placed the marker to the rear of the true midpoint) was found when the panel density increased. When the experiment was repeated with binocular viewing, overconstancy was found but it was not influenced by panel density.

Bibliography on

Feedback and Regulation of Movement Behavior

GENERAL

Armstrong, Terry Reid. Feedback and perceptual-motor skill learning: A review of information feedback and manual guidance training techniques. In Human Performance Center — Technical Report No. 25. Ann Arbor: University of Michigan, 1970.

Presents an excellent review of literature relating to feedback and skill learning. Defines terminal and concurrent feedback. Describes information feedback as either being external or internal. Defines intrinsic and augmented feedback. Summarizes research dealing with feedback and the Pedestal Sight Manipulation Test, pursues motor research and other motor tasks.

Bilodeau, Edward A. Supplementary feedback and instructions. In Principles of Skill Acquisition, edited by E. A. Bilodeau, pp. 235-253. New York: Academic Press, 1969.

Reviews research literature dealing with experimental techniques of providing feedback in the form of instructions to the subjects.

Bilodeau, Ina McD. Information feedback. In Acquisition of Skill, edited by E. A. Bilodeau, pp. 255-296. New York: Academic Press, 1966.

Reviews studies of information feedback or "error" information dealing with frequency, direction, locus, and augmented information feedback.

Bilodeau, Ina McD. Information feedback. In Principles of Skill Acquisition, pp. 255-285. New York: Academic Press, 1969.

Explains the terminology used in feedback research. Reviews research literature dealing with acquisition and information feedback.

Robb, Margaret. Feedback. *Quest* 6 (1966): 38-43.

Presents an introduction to the role, types, and description of feedback. Explains the applications of feedback in physical education.

Taub, Edward and Beman, A. J. Movement and learning in the absence of sensory feedback. In *The Neuropsychology of Spatially Oriented Behavior*, pp. 173-192. Homewood, Ill.: Dorsey Press, 1968.

Reviews experiments eliminating sensation from various portions of the monkey's body and testing the amount of movement and learning afterwards.

RESEARCH

Anderson, Bruce. The influence of model performance and feedback on the learning of a complex motor skill. *Completed Research in Health, Physical Education, and Recreation* 12 (1970): 150-151.

During a five-hour golf instruction unit on the short swing, the subjects either viewed the performance of a filmed model or received one of three types of feedback: kinesthetic only, kinesthetic plus knowledge of results, or kinesthetic plus knowledge of results and corrective comments. Viewing the filmed model did not facilitate learning, but knowledge of the results did facilitate learning; this facilitation of learning was increased when there were corrective comments.

Aten, Rosemary. The effects of repeated trials with score information provided or withheld on throwing velocity of high and low performers. *Dissertation Abstracts* 31 (1971): 5172A.

The subjects, 937 college females, were given the Softball Throw for Velocity Test. The 37 highest and lowest performers were selected to be in the study. Part of the high and low performers practiced throwing for velocity with verbal feedback and visual feedback from the velocimeter. The other high and low performers were not informed of their ball velocity after each throw. The high performers improved, while the low performers did not improve. Score information did not affect performance.

Bell, Virginia Lee. Augmented knowledge of results and its effect upon retention of a gross motor skill. *Research Quarterly* 39 (1968): 25-30.

This study investigated the effects of various conditions of augmented knowledge of results on the badminton serve. No significant difference was found between groups on retention of the task.

Berndsconi, Charles Edward. The relative effectiveness of varying information feedback in the learning of a discrete sports skill. *Completed Research in Health, Physical Education, and Recreation* 12 (1970): 263.

Four conditions of information feedback were examined for the short serve in badminton: no feedback, immediate feedback, seven-second delayed feedback, and one-trial delayed feedback. The immediate information feedback was superior to no information feedback, but the immediate information feedback was not superior to the delayed information feedback.

Burkhard, Donald D.; Patterson, James; and Rapue, Robert. Effect of film feedback on learning the motor skills of karate. *Perceptual and Motor Skills* 25 (1967): 65-69.

Caine, J. E. The effect of instant analysis and reinforcement of motor performances through the use of cinematography techniques related to television. *Dissertation Abstracts* 27 (1967): 3705-3706.

During a bowling unit for beginners, no differences in bowling performances were found between bowlers receiving instant replays of their performance, and those who did not receive instant replays.

Chase, R. A.; Sutton, S.; and Rapin, I. Sensory feedback influences on motor performance. *Journal of Auditory Research* 1 (1961): 212-223.

Cooper, Walter Elmore. Videotape replay feedback in learning selected gross motor skills. *Dissertation Abstracts* 30 (1970): 3775A-3776A.

During a basketball unit for seventh grade boys, five information feedback conditions were investigated: (1) auditory feedback, (2) videotape feedback, (3) combination auditory and video feedback, (4) no feedback from the instructor, and (5) the control group. Lay-up performance and the Knox Wall Bounce Test were not affected by information feedback conditions during the basketball unit. The auditory and video information feedback group performed best on the Johnson Motor Battery Test.

Day, Phyllis. Comparison of tactual and kinesthetic feedback. *Dissertation Abstracts* 26 (1965): 2577-2588.

A standard hypnotic scale was used to induce hypnosis. Ablation of tactual sensitivity was accomplished through suggestions of anesthesia. A ball impact simulator was used which provided a standard impact similar to that of a tennis ball being hit with a racket during a swing. During ablation of tactual cues of the palm, fingers, and tongue by means of hypnotic suggestions, there were greater errors in performance than during the hypnotic and walking base states.

Fox, Paul W. and Levy, Michael C. Acquisition of a simple motor response as influenced by the presence or absence of action feedback. *Journal of Motor Behavior* 1 (1969): 169-179.

College students performed a pencil tracking accuracy task with two feedback conditions, terminal and action feedback. The skill transfer from action feedback to terminal feedback was a negatively accelerated growth function of the number of trials devoted to action feedback. When subjects receiving combinations of action and terminal feedback were tested without feedback, there was no deterioration in accuracy.

Greenwald, Anthony G. Sensory feedback mechanisms in performance control: With special reference to the ideomotor mechanism. *Psychological Review* 77 (1970): 73-90.

Reviews theory and evidence for four mechanistic conceptions of the sensory feedback processes: serial chaining, fractional anticipatory goal response, closed-loop, and ideomotor.

Harari, Herbert. Level of aspiration and athletic performance. *Perceptual and Motor Skills* 28 (1969): 519-524.

The subject's time was recorded for the first 750-yard run, and information feedback on the first run was given one week later immediately prior to the second run. The feedback consisted of either the subject's time or the group's mean time for three parts of the race. There were six feedback conditions: (1) times on the subject's first trial, (2) mean group times, (3) 10 percent less than the subject's times on the first trial, (4) 10 percent less than the mean group time, (5) 10 percent more than the mean group time, and (6) 10 percent more than the subject's times on the first trial. The group receiving successful feedback performed better than the failure group and the control group.

James, Pamela E. Video feedback in learning beginning trampoline. *Perceptual and Motor Skills* 32 (1971): 669-670.

The experimental group of 11- and 12-year-old boys was given videotape feedback on four basic drops and a seven-bounce routine on the trampoline. The control group did not receive videotape feedback. The experimental group was superior after 11 sessions. Only the control subjects with a high verbal ability achieved a high performance at the end of 11 sessions.

Katz, Milton S. Feedback and accuracy of target positioning in a homogeneous field. *American Journal of Psychology* 80 (1967): 405-410.

Until a criterion of accuracy was reached, the subjects were given information feedback on the positioning of a dot of light in the middle of a homogeneous visual field (a curved blank wall). The control subjects were not given feedback. The subjects receiving information feedback made less errors on the trials with feedback and subsequent trials.

Keele, Steven W. Movement control in skilled motor performance. *Psychological Bulletin* 70 (1968): 387-403.

Reviews the research and theory dealing with movement control in a skilled movement performance. Topics discussed include direction of movement, speed-accuracy trade-off, Fitts' Law, visual feedback, kinesthetic feedback, attention to feedback, formation of motor programs, motor program theory, movement extent, and memory for movement.

Keele, Steven W. and Posner, Michael I. Processing of visual feedback in rapid movements. *Journal of Experimental Psychology* 77 (1968): 155-158.

The subject's movement time was defined as the time after the stylus was moved from homeplate until the stylus reached the target. The efficiency of visual feedback was affected by movement time. Visual feedback did not facilitate accuracy in hitting the target when the movement time was as short as 190 msec., but did facilitate accuracy when the movement time was 269 msec. or longer.

Laszlo, Judith I.; Shamoan, J. S.; and Sanson-Fisher, R. W. Reacquisition and transfer of motor skills with sensory feedback reduction. *Journal of Motor Behavior* 1 (1969): 195-209.

The subjects did two motor tasks, key tapping and circle drawing, with normal or reduced feedback. The reduced feedback was either kinesthetic reduction or concurrent visual (blindfold) and auditory (white noise) reduction. The kinesthetic and tactile reduction was accomplished by application of a nerve press. The individuals in the study fell into two distinct groups according to their rate of reacquisition. The results of this study indicated that restoration of sensory feedback of only limited sensory feedback is not always present.

Lloyd, John R. The effect of audio and visual feedback on the learning of a gross motor skill when imposed at selected stages of a learning period. *Dissertation Abstracts* 29 (1969): 2987.

The use of slow-motion pictures of the subjects during a 16-week tennis unit did hasten improvement of the forehand and backhand ground strokes, except for those subjects classified as beginners.

Lundquist, Alexander T. Immediate knowledge of results via video tape relay and its effect on the learning of selected football skills. *Completed Research in Health, Physical Education, and Recreation* 11 (1968): 195.

One group of football players had traditional training using demonstrations and verbal cues, one group had a training film of selected football skills, and one group viewed a videotape of their performance. At the end of five weeks, no differences were found among groups on a test of selected football skills.

Malina, Robert M. Performance changes in speed-accuracy task as a function of practice under different conditions of information feedback. Completed Research in Health, Physical Education, and Recreation 6 (1964): 110.

Overarm throwing accuracy and speed were affected by feedback conditions during a four-week training program.

Malina, Robert M. and Rarick, Lawrence G. A device for assessing the role of information feedback in speed and accuracy of throwing performance. Research Quarterly 39 (1968): 220-223.

Describes a device for assessing the role of information feedback in speed and accuracy of throwing performance.

Mathews, Edsel Lee. The effectiveness of videotape replay as an adjunct in teaching the golf swing. Dissertation Abstracts 31 (1971): 5826A.

The experimental groups were instructed to use the seven iron in golf with videotape feedback. The control group had the conventional method of instruction. All groups except the males in the control group improved on the Bensen Golf Test. The experimental groups improved more than the control group.

Mostofsky, David and Noyes, Marianne. Attentional factors in delayed vocal auditory feedback effects on concurrent motor tasks. Journal of Auditory Research 9 (1969): 51-56.

The subject read a standard passage and recited a nursery rhyme under three motor conditions: (1) while tapping a silent key at the rate of two taps per second, (2) while tapping a silent key at the rate of two taps per second which served to illuminate a darkened room, and (3) with no concurrent motor task. All three motor conditions were performed with immediate and delayed (.16 seconds) binaural feedback. The motor task performance deteriorated during the delayed feedback of verbal material which was being read or recited.

Ochs, Keith M. The effect of videotape replay as an instructional aid in beginning bowling classes. Dissertation Abstracts 31 (1971): 5183A.

College students in a bowling class received one of three types of feedback: visual, auditory, and auditory-visual. The visual group saw a videotape replay of their performance after each two ball trials. The audio-visual group also saw the videotape of their performance and received verbal feedback. The auditory group only received verbal feedback. No form differences were found among the groups after 13 weeks of instruction.

Olson, Lloyd C. Instant feedback via videotape and its effect on the learning of a selected side horse routine. *Completed Research in Health, Physical Education, and Recreation* 12 (1970): 206.

The experimental group received three weeks of traditional training on the side horse, accompanied by videotape feedback of their performance. The control group did not have the videotape feedback. At the end of the training, there were no performance differences between the two groups.

Paulat, James G. The effects of augmented videotaped information and loop film models upon learning a complex motor skill. *Completed Research in Health, Physical Education, and Recreation* 12 (1970): 229.

The videotape treatment improved performance, and the loop film models did not improve performance.

Paulat, James Gustave. The effects of augmented videotaped information feedback and loop film models upon the learning of a complex motor skill. *Dissertation Abstracts* 30 (1970): 3307A-3308A.

The subjects, college students, were either shown a videotape replay of their tennis forehand drive or a film of a model performing the forehand drive. During the tennis unit, the videotape group improved more than the group viewing the model.

Rapin, Isabelle et al. Effects of varying delays in auditory feedback on keytapping of children. *Perceptual and Motor Skills* 16 (1963): 489-500.

Children, 6 to 11 years old, tapped a key in groups of three taps with a click as immediate and delayed feedback. The force of the taps, the total time for 30 taps, and the amount of time the finger rested on the key were recorded. Force increased when the feedback was delayed; the amount of force increase was not affected by the amount of delay. Delayed feedback disrupted key tapping and total time.

Rapin, I. et al. Key tapping and delayed feedback. *Journal of Speech and Hearing Research* 9 (1968): 278-288.

Normal and deaf children tapped a key in groups of three taps with a click or flash as immediate or delayed feedback. Delayed feedback with flashes disrupted 72 percent of the normal children's performance, and delayed feedback of clicks disrupted 91 to 93 percent of the normal children's performance. No differences between immediate and delayed feedback were found for peripherally deaf children. Disrupted performance for children was an increase in force of taps, a decrease in the rate of tapping, and errors in grouping.

Rey, Patricia. The effects of video-taped feedback and environmental certaining on form accuracy and latency during skill acquisition. Dissertation Abstracts 31 (1971): 3317.

During a fencing unit, the subjects received videotaped feedback of their performance on a modified fencing lunge. Two conditions of certainty were included in the experiment. The subjects in both conditions lunged at one of two targets when it was illuminated. The certainty condition subjects were told before the seven-second preparatory period which target would be illuminated. The uncertainty condition subjects were not given advance information about which target would illuminate. The environmental certainty conditions influenced form and latency scores. Videotaped feedback improved form. No correlation was found between form and accuracy.

Robb, Margaret D. Feedback and skill learning. Dissertation Abstracts 27 (1967): 2060.

Five conditions of feedback were given to subjects during a novel motor task involving specified movements of the arms. The subjects tracked a moving target on an oscilloscope by keeping a cursor superimposed on the target. The cursor was controlled by moving a handle as a control device. The concurrent feedback conditions were altered by either blanking out the visual feedback from the oscilloscope for specified parts of the trials, not permitting the subject to watch the oscilloscope on specified trials, or performing the tracking task while the target was moving at slow speeds. During part of the trials two types of terminal feedback were given: error scores after each trial, or visual-graphic feedback after groups of 10 trials showing the subjects the point-for-point errors they made on the previous trials. The results indicate that concurrent feedback may be more valuable to the performance of this movement task than terminal feedback. The use of targets moving at slower speeds was not beneficial to this motor task, which involved timing. Practice was important to the performance of this task, but practice plus feedback was better, and practice plus concurrent feedback was best.

Robb, Margaret D. Feedback and skill learning. Research Quarterly 39 (1968): 175-184. Reprinted in Contemporary Reading in Sport Psychology, pp. 36-47. Springfield, Ill.: Charles C. Thomas, 1970.

Robb, Margaret and Teeple, Janet. Video-tape and skill learning: An exploratory study. Educational Technology 9 (1969): 79-82.

This study (1) investigated the relationship between the instructor's evaluations and the student's self-evaluations before and after viewing videotaped performances of the bowling approach and (2) identified some of the problems and future areas of study associated with the use of videotape and physical education. Thirteen college students each bowled three successive trials while being videotaped. The subjects and the instructor evaluated the performances during the trials and after viewing the videotapes. The results indicated that the subjects did not significantly alter the rating of their performance after viewing themselves on videotape, while the instructor did alter the rating of two errors in the approach after viewing the videotape.

Small, Frank. Specificity and delay of information feedback as factors in the learning of a motor skill. *Completed Research in Health, Physical Education, and Recreation* 12 (1970): 281-282.

The motor skill was the delivery of a duckpin bowling ball at a specific velocity. Training with feedback precise to .01 second did not result in a different level of performance when compared to feedback as precise as .1 second. Immediate or 15-second delayed feedback improved performance more than 30-second delayed feedback.

Smith, Barbara B. The effectiveness of television videotape instant playback in learning in pitch and run shot in golf. *Completed Research in Health, Physical Education, and Recreation* 11 (1969): 163.

No differences were found between groups receiving videotape feedback of the pitch and run golf shot, and groups not receiving videotape feedback of this golf shot.

Smith, Karl U. and Putz, Vernon. Feedback analysis of learning and performance in steering and tracking behavior. *Journal of Applied Psychology* 54 (1970): 239.

The difference between steering and tracking behavior is defined. Only steering, not tracking, involves the change of position of the individual in space while controlling a vehicle or device. The learning curves for steering and tracking are examined. The most rapid and greatest amount of learning occurred in the steering situation.

Smith, Karl U. and Putz, Vernon. Feedback factors in steering and tracking behavior. *Journal of Applied Psychology* 54 (1970): 176-183.

The difference between steering and tracking behavior is defined. Only steering involves the change of position of the individual in space while controlling a vehicle or device. Feedback delays influenced steering and tracking performances, with steering performance being more affected. The examination of oscillograph records of hand motion, respiration, tracking errors, and movement velocity indicated that the feedback delay disturbed all components of the task.

Thompson, Donnis Hazel. Immediate external feedback in the learning of golf skills. *Research Quarterly* 40 (1969): 589-591.

The findings indicate that immediate information feedback through the use of the graph-check-sequence camera facilitates the learning of the golf drive and the five-iron approach shot.

Wrenn, Jerry Parker. Videotape feedback as it influences elementary school children in their ability to perform a motor task. *Dissertation Abstracts* 31 (1971): 3945A.

Only the experimental group received videotape feedback of their performance on the Motor Performance Multi-Recording Instrument. The experimental group performed better than the control group at all age levels.

Bibliography on || Figure-Ground Perception/
Field Dependence/
Field Independence

INTRODUCTION

Factors such as figure-ground (the ability to separate a more dominant and important visual item from a less dominant, less important visual item) and field independence (the ability to make visual judgments independent of the context in which they are to be made) may be important in a consideration of movement performance. Performers are often requested to differentiate figures from grounds in ball-handling activities and games. Sometimes the figures in these games are stationary. More often they are moving. Frequently, performers are asked to make judgments about movement within a bounded area that shares contours with other bounded areas. It may be that certain physical activities require more field independence for excellence of performance than do others (e.g., tennis as opposed to dance). It may be that choice of activity is related to figure-ground skills. It may be that field dependency is related to accuracy in games that are emotionally charged. All of these things imply our need to know about the relationship between movement and figure-ground perception/field dependency.

GENERAL

Bowman, Jan C. *The Figure-Ground Phenomenon in Experimental and Phenomenological Psychology*. Stockholm, Sweden: University of Stockholm, 1968.

Hebb, D. O. *The Organization of Behavior*, pp. 19-26. New York: John Wiley & Sons, 1949.

Deals with Hebb's contribution toward a more sophisticated concept of figure-ground perception than that of the Gestaltists. The Gestaltists believed that figure-ground perception was an innate ability, relatively little affected by

prior experience and learning. Hebb supports and explains his concept of figure-ground perception both as an innate phenomenon as well as a phenomenon very much influenced by learning and prior experience.

Rubin, Edgar. Figure and ground. In *Readings in Perception*, edited by M. Wertheimer, pp. 194-203. Princeton, N.J.: D. Van Nostrand Co., 1958.

An abridged translation dealing with the nature of the figure-ground phenomenon as rendered by the originator of the Gestaltist concept of the figure-ground phenomenon. Figure-ground is defined, described, and discussed quite clearly.

Zusne, Leonard. *Visual Perception of Form*, pp. 113-124. New York: Academic Press, 1970.

Describes the figure-ground phenomenon, information concerning the origin of the concept, and an overview of research from the early part of this century to present day. Included is a discussion of variables known to influence and vary along with figure-ground perception.

RESEARCH

Barrett, Gerald V. and Thornton, Carl L. Two methods of determining body sensitivity: A comparison and evaluation. *Perceptual and Motor Skills* 25 (1967): 374-376.

Using the rod and frame apparatus originated by Witkin, this study tests Witkin's contention that field independence is associated with certain conditions of body orientation. Results did not prove favorable to Witkin's contention.

Bolen, Janet Elaine. Figure ground perception in women majors in dance and in physical education. Master's thesis, University of Los Angeles, 1961.

Found no significant difference in the figure-ground orientation of women physical education majors as opposed to dance majors when administered the Gottschaldt Embedded Figures Test.

Gallahue, David. The relationship between perceptual and motor abilities. *Research Quarterly* 39 (1968): 948-952.

Found that performance of a locomotor task by kindergarten children was affected by various stationary figure-ground patterns upon which they moved.

Gorman, Bernard S. Field dependence and visual maze learning. *Perceptual and Motor Skills* 27 (1968): 142.

Sixteen field dependent and 16 field independent undergraduate subjects were given five trials on a paper and pencil maze task. Results indicated that field independent subjects performed significantly better than did field dependent subjects. There was no significant interaction between the effect of field dependence and trials.

Herkowitz, Jacqueline. Filmed test to assess elementary school-aged children's perception of embedded figures which appear to move away from stationary backgrounds. Ph.D. dissertation, Purdue University, 1971.

A 16mm, filmed, animated test which involves 27 items. Subjects must make judgments about embedded figures which appear to move against complex backgrounds. The test, called the Moving Embedded Figures Test (MEFT), is described. Reliability, validity, and normative data are presented.

Hunt, Valerie. Movement behavior: A model for action. *Quest* 2 (1964): 69-91.

A very good discussion of figure-ground perception and implications of the relationship between it and movement behavior.

Kreiger, Jane C. The influence of figural-ground perception on spatial adjustment in tennis. Master's thesis, University of California — Los Angeles, 1962.

Found that the ability to perform on the Gottschaldt Embedded Figures Test was moderately correlated with the ability of tennis players to adjust a tennis racquet to incoming balls thrown from various angles by a mechanical device.

Montgomery, Anne Marie. The effect of visuo-motor training of figure-ground perception in four- and five-year old boys and girls. Master's thesis, Purdue University, 1970.

The purpose of this study was to determine the effects of visuo-motor training on figure-ground perception as determined by performance on the Karp and Konstadt revision of the Children's Embedded Figures Test (CEFT). Thirty four- and five-year-old boys and girls participated in the study. Findings indicated that specific training given did not result in improved performance on the embedded figures test, but did improve the ability to judge the landing position of a projected object.

Torres, Judith Anne. The relationship between figure-ground perceptual ability and ball catching ability in ten- and thirteen-year-old boys and girls. Master's thesis, Purdue University, 1966.

Found that the ability to make spatial adjustments in ball catching by 10- and 13-year-old children was positively related to performance on the Gottschaldt Embedded Figures Test.

Witkin, Herman A. et al. *Personality Through Perception*. New York: Harper & Brothers, 1954.

The book reports a large number of studies (many of which had been previously documented in the literature) dealing with the concept of field dependence and independence. A good deal of normative data is made available on tests of spatial orientation (Rod and Frame Test, Rotating Room Test, Tilting Room-Tilting Chair Test) and the Witkin Embedded Figures Test. Developmental considerations receive a good deal of attention.

Bibliography on

Reduced and Supplementary Perceptual Cues and Movement

INTRODUCTION

The movement performer's use of perceptual cues in the environment may be investigated by reducing and supplementing information available from these cues. The performer's use of a cue cannot be evaluated until it is eliminated or reduced. Supplementary information about a salient perceptual cue in the environment may improve movement performance. The use of reduced and supplementary perceptual cues by movement performers is an important area of concern in perceptual-motor development.

RESEARCH

Day, Phyllis. Comparison of tactual and kinesthetic feedback. Dissertation Abstracts 26 (1965): 2577-2578.

Ablation of tactual sensitivity was accomplished through suggestions of anesthesia and a standard hypnotic scale. A ball impact simulator provided a standard impact similar to that of a tennis ball hit with a racket during a swing. During ablation of tactual cues of the palm, fingers, and thumb by means of hypnotic suggestions, there were greater errors in performance than during the hypnotic and walking base states.

Dickinson, U. The training of mobile balancing under a minimal visual cue situation. *Ergonomics* 11 (1968): 69-75.

Six groups of subjects were given different training procedures for heel-to-toe walking on a beam, two inches wide. The completely blindfolded group performed better than the sighted or minimal cue groups. Implications for the blind were discussed.

Fisher, Gerald H. Agreement between the spatial senses. *Perceptual and Motor Skills* 26 (1968): 849-850.

The subjects judged the relative positions of two stimuli from two different modalities. The following modalities were paired: visual and tactile, tactile and auditory, and auditory and visual. Constant errors were found which implied that agreement between the spatial sense is apparent rather than accurate.

Keogh, Barbara K. Pattern walking under three conditions of available cues. *American Journal of Mental Deficiency* 74 (1969): 376.

Mentally retarded boys were asked to walk around the floor during three experimental conditions. They were to walk in a pattern replicating the patterns of line drawings posted on the wall of the room. The experimental conditions were three different types of floor surfaces: plain, square patterned, and sand covered. The boys' walking pattern did not improve under any one of the conditions. The mentally retarded children appeared to be confused and disoriented when compared to normal children.

Laszlo, Judith. The performance of a simple motor task with kinesthetic sense loss. *Quarterly Journal of Experimental Psychology* 18 (1966): 1-8.

The nerve compression block was investigated as a technique for eliminating the kinesthetic sense. The kinesthetic sense was eliminated after 20 to 25 minutes, and muscle power was not effected. The lack of the kinesthetic sense brought about a decrement in key tapping performance. The loss of the tactile sense was also observed.

Legge, D. Analysis of visual and proprioceptive components of a motor skill by means of a drug. *British Journal of Psychology* 56 (1965): 243-254.

The subject was asked to point a vertical stylus to a position in line with a horizontal target line. The target line and stylus could be perceived visually or proprioceptively. All four possible combinations of perceptual modes were examined. Under the influence of the drug, the subjects accepted misalignments which were corrected when performing without the drug. The subjects were more accurate when both the stylus and target were perceived visually. The motor task performance decreased when it was presented partially in two different modalities.

Levy, P. Variables affecting the accuracy of limb positioning. *Dissertation Abstracts* 28 (1968): 4321.

The findings of this study indicate that the relationship of the visual and kinesthetic modalities, rather than the sheer amount of sensory information, is more important in forearm positioning.

Mikaelian, Hilt. Adaptation to rearranged eye-foot coordination. *Perception and psychophysics* 8 (1970): 222-224.

Subjects performed three types of movement while their vision was distorted by prisms: walking, leg movements, and arm movements. Viewing arm movements did not change their eye-foot coordination. Walking and viewing leg movements with prisms produced changes in eye-foot coordination and egocentric localization (subject rotated his chair to bring a light target straight ahead of him). Viewing leg and arm movements through prisms brought changes in eye-hand coordination.

Mikkonen, V. and Kolehmainen, K. On the nonvisual cues controlling throwing movements. *Scandinavian Journal of Psychology* 9 (1968): 169-176.

Experiment one. The head-body relation was varied in the throwing situation while the hand-body relation was constant. The lamp attached to the subject's head turned off immediately after the throw so the subject could not see the place where the darts hit. The lamp and the head position were varied. If the subject's head was turned left, the lamp was turned right. If the subject's head was bent back, the lamp was turned downward. The direction of the throw tended to co-vary with the direction of the head.

Experiment two. The subjects were given enough training and feedback to learn to throw accurately at a target when their head was turned to the right or left. When they attempted to throw the darts facing the target without feedback, the darts hit on the side of the target opposite the prior head displacement.

Experiment three. This experiment investigated the reason for the throwing displacement in the final phase of experiment two. The vertical displacements of hits were due to change in the direction of throwing, and the horizontal displacements were due to changes in the starting position and the direction of throwing.

Smith, P. C. and Smith, O. W. Ball throwing responses to photographically portrayed targets. *Journal of Experimental Psychology* 62 (1961): 223-233.

Twenty-five targets were located at one of five distances from the viewer. At each distance, five targets were located at a different angle from the viewing station. A flat yellow target, eight inches in diameter, was placed on one specified target for the trial. The subject tossed a ball at the yellow target during three restricted visual field conditions and during unrestricted monocular and binocular viewing. The subjects threw the ball harder when the visual field was unrestricted. The experiment was repeated with the subjects viewing photographs rather than the restricted visual field. The subjects' performance did not differ when they viewed the actual targets or the photographs of the target. In both experiments the subjects undershot the far targets and overshot the near targets.

Souder, Marjorie Ann. A study of the visual and proprioceptive determinants of space perception and movement. Dissertation Abstracts 29 (1969): 4313A.

This study investigated the relationship between perception of the upright posture in two-dimensional space and movement accuracy as measured in postural tracking. Movement accuracy was examined during luminated and dark conditions and during left-right and forward-back direction conditions. Percentile test scores were used to assign college females to either a high or low group and then postural tracking was examined. The high group was able to perform postural tracking with greater accuracy than the low group. Postural tracking was more accurate when the body shifted from right to left and when the visual field was completely luminated.

Vaught, G. M.; Simpson, W. E.; and Ryder, R. B. Feeling with a stick. *Perceptual and Motor Skills* 26 (1968): 848.

The subjects were asked to discriminate six "random" shaped forms using a stick or their bare hands. There was no difference in the form perception between the trials with the stick and the trials with the hands.

Vogel-Sprott, M. Influence of peripheral visual distraction on perceptual-motor performance. *Perceptual and Motor Skills* 16 (1963): 765-772.

Each of the subjects had to press one of three buttons in front of him according to the position of two rotating dials and signals from two lights directly in front of him. To the left and right of this visual display, directly in front of the subject, there were two slide screens with slides exposed for 30 seconds, and a new slide every 15 seconds. The slides included babies, nudes, landscapes, and printed advertising slogans. The subjects with the slides as peripheral visual distractions performed at a slower speed with more errors.

Wapner, S. and Witkin, H. A. The role of visual factors in maintenance of body balance. *American Journal of Psychology* 63 (1950): 385-408.

Maintenance of body balance was studied during four visual field conditions: full visual field, limited field, no visual field, and an unstable, moving field. As the visual field was weakened, the balance performance involved the use of the stabilometer.

Bibliography on || Visual and Size Perception and Movement

INTRODUCTION

The performer's accurate estimation of stationary and mobile objects in his environment may be a consideration in successful and efficient movement. Movement performers, while stationary and moving, must estimate accurately the size of many familiar and unfamiliar objects, people, groups of people, and unfilled or empty spaces in their environment.

GENERAL

Epstein, William. *Varieties of Perceptual Learning*. New York: McGraw-Hill Book Co., 1967.

Chapter II. The assumption context: The perception of size and distance. Reviews research literature related to the perception of size and distance. The bibliography includes over 45 references.

Gibson, James. *The Perception of the Visual World*. Boston: Houghton Mifflin Co., 1950.

Chapter IX. The constant sizes and shapes of things. Discusses the constancy of perceived objects with respect to size. Explains visual angles.

Ittelson, William H. *Visual Space Perception*. New York: Springer Publishing Co., 1960.

Chapter IV. Visual cues, equivalent configurations, the invariance hypothesis. Provides a classification for the visual space cues. Explains the function of the space cues. Defines the concept of equivalent configurations. Explains the size-distance invariance hypothesis.

Chapter V. Size, shape, perspective. Discusses some of the research which relates to these topics: absolute size as a cue to absolute distance, relative size as a cue to relative distance, changing size as a cue to radial motion, and apparent size and size constancy. Explains the perception of size.

RESEARCH

Drowatzky, John N. Relationship of size constancy to selected measures of motor ability. *Research Quarterly* 38 (1967): 375-379.

The findings of this study indicate that there may be a relationship between size constancy and measures of leg power, dynamic balance, and total body agility.

Epstein, William. Size and distance conditions under reduced conditions of viewing. *Perception and Psychophysics* 6 (1969): 269-272.

Size estimations were made during three viewing conditions: (1) physical size and distance variant, visual angle of the variable constant and equal to the standard; (2) physical size constant, physical distance, and visual angle changing; and (3) physical distance constant, physical size, and visual angle changing. Variables with larger visual angles than the standard were estimated as larger and nearer. These two statements were only consistent for conditions one and two.

Fernandez, Genelle Helen. The ability of highly skilled and poorly skilled movement performers to estimate the size of selected objects at varying distances. Master's thesis, Purdue University, 1967.

This study investigated differences between highly skilled and poorly skilled movement performers in the ability to estimate the size of selected objects at various distances. No size estimation differences were found between the two groups of performers except for the 16-inch object. Younger subjects (16-year-olds) took less time to make size estimations than older subjects (19-year-olds), but there was no difference between these two groups in the accuracy of estimation.

Franklin, Samuel S. Perceived size of off-size familiar objects under normal and degraded viewing conditions. *Psychonomic Science* 15 (1969): 312-313.

The subjects estimated the height of off-size (the object size was either enlarged or reduced 25 percent) chairs under normal and degraded viewing conditions. The control subjects estimated abstract forms that were the same height and complexity as the experimental chairs. Only the object was illuminated during degraded viewing conditions. The findings of this study indicate that the large and small chair sizes were underestimated relative to the control object.

Gogel, W. C. and Mertins, H. W. Perceived size and distance of familiar objects. *Perceptual and Motor Skills* 25 (1967): 213-225.

This study investigated perceived size of a playing card in relation to the projected size of the visual image of the retina. Both stationary and moving stimuli were investigated. The playing cards were perceived as larger than their physical or absolute size, especially when the cards were close to the subject.

Kinney, Jo Ann. Conflicting visual and tactile kinesthetic stimulation. *Perception and Psychophysics* 8 (1970): 189-192.

The subjects, who were underwater, were asked to match disks to familiar coin sizes from memory. The subjects chose disks smaller than the actual coin size, which matched the optical size in the water. This happened even when the subjects could touch the coins. Blindfolded subjects made less accurate matches underwater than on land without a blindfold. The authors felt that these results demonstrate the dominance of vision over the other senses.

Luria, S. M.; Kinney, Jo Ann; and Weissman, Seymour. Estimates of size and distance underwater. *American Journal of Psychology* 80 (1967): 282-286.

The subjects judged the size of an underwater square by comparing it to a series of varied size squares. The underwater squares were 5 to 12 feet from the porthole which the subject observed. The subject judged these objects at the same distances on land. The size of the objects was overestimated underwater as compared to estimations on land.

McDermott, William P. Linear perspective and perceived size. *Perception and Psychophysics* 5 (1969): 33-36.

Each of the subjects looked into a box with a variety of reduced visual cue information and made size judgments of triangular forms. The floor of the box between the triangular forms and the subject was covered with a perpendicular striped pattern. The subjects were able to make fairly accurate size estimates when a variety of reduced visual cue information for distance was combined with linear perspective information.

McDermott, William P. Relative distance cues and perceived size. *Perceptual and Motor Skills* 27 (1968): 1335-1339.

The findings of this experiment indicate that individual cues to distance have little effect on size perception.

Over, Ray. Size and distance-estimate of a single stimulus under different viewing conditions. *American Journal of Psychology* 76 (1963): 452-457.

Size estimates were made during two viewing conditions, unrestricted and reduced. Reduced conditions were a darkened room, monocular viewing,

and unrestricted head movements. The subjects underestimated and overestimated the size of the objects in both conditions depending on the size and distance of the object.

Owen, Dean H. Shape correlates of visual and tactual size judgments: A contrast with complexity. *Perception and Psychophysics* 8 (1970): 20-22.

Random forms with varying complexities (number of sides) were equated in area, and presented to the subject visually (black on white background) and tactually (fine sandpaper on smooth poster board). The subject assigned a size value to each form according to a seven-point scale ranging from "extremely small" to "extremely large." His verbal response stopped a timer indicating his latency time. The results indicated that by holding the area of forms constant, the perceived size was related to some characteristics of shape. No relationship was found between size ratings and the number of sides. There was no significant difference in cross-modality size judgments.

Pantle, Allan and Sekuler, Robert. Size-detecting mechanisms in human vision. *Science* 162 (1968): 1146-1148.

The results of this experiment indicate that the human visual system contains several different classes of size detectors, each maximally sensitive to visual target sizes in a particular range.

Ross, H. The size-constancy of underwater swimmers. *Quarterly of Experimental Psychology* 17 (1965): 329-337.

This study investigates the size-constancy of divers in clear and murky water, and on land. The water condition judgments took place in a swimming pool. A small standard disk was in a fixed position underwater. The subject adjusted the distance of a larger disk until it appeared to be equal in phenomenal size to the smaller disk. The size-constancy ratios in clear water were greater than the size-constancy ratios on land. The orientation of the display, or the diver's body, did not affect constancy underwater as it does on land.

Ross, Helen E. Water, fog, and the size-distance invariance hypothesis. *British Journal of Psychology* 108 (1967): 301-313.

Divers were required to make size judgments on land and in the water. The underwater judgments were considerably larger than the land judgments.

Shiffman, H. R. Size-estimation of familiar objects under informative and reduced conditions of viewing. *American Journal of Psychology* 80 (1967): 229-235.

The subjects judged normal sized objects, off-sized normal objects, and wooden objects during three different viewing conditions: ample visual information, reduced information, and monocular reduced information. The results indicated that with ample visual information, known size was not one of

the determinants of estimated size, but a memorial process was used during reduced visual information conditions.

Smets, Gerda. When do two figures seem equal in size? *Perceptual and Motor Skills* 30 (1970): 1008.

The results of this study indicate that two figures were judged to be equal in size only when their physical size (surface area) and contour length are considered.

Smith, O. W. and Smith, P. C. Developmental studies of spatial judgments by children and adults. *Perceptual and Motor Skills* 22 (1966): 3-73.

I. Some dimensions of space perception. A factor analysis of 40 perceptual tasks involving judgments of size, distance, motion, visual direction, curvature, and body size showed the factor structure of children and adults to be remarkably similar.

II. Aptitudes and the self as bases for theory of size-distance perception. Eleven of the 40 tasks used in Part I were analyzed separately. These tasks involved judgment of size and distance under three different reduced conditions: (1) no cues for distance using an unknown test object; (2) monocular view with only the tilt of the head as the principle cue for distance; and (3) monocular view of a familiar object (a baseball). Results indicate that the basic cues for distance are dependent upon the subject's body dimensions and his capacity for spatial performance. Judgments of size and distance did not correlate positively, indicating that different cues may be functional for size and distance judgments.

III. Familiar size as a cue for judgments of size and distance. The subjects, children and adults, monocularly viewed a baseball and then indicated, from a set of circles, the circle that was the same size as the baseball. The subject then indicated the size of a black dot and then indicated the size of the baseball when viewed monocularly. The children made their monocular judgments using either physical size or visual angle cues while adults made no visual angle matches.

Verillo, Ronald T. and Graeff, Christopher K. The influence of surface complexity on judgments of area. *Perception and Psychophysics* 7 (1970): 289-290.

The apparent size of squares increased as a function of physical size and complexity. The most complex surfaces were judged approximately 30 percent larger than most simple surfaces.

Wohlwill, Joachim F. The perspective illusion: Perceived size and depth in fields varying in suggested depth in children. *Journal of Experimental Psychology* 114 (1962): 300-310.

Wohlwill, Joachim F. Smith's developmental studies of spatial judgments: A note. *Perceptual and Motor Skills* 23 (1966): 137-138.

Wohlwill critiques the Smith and Smith interpretation of their 1966 experiments.

Zinkus, Peter W. The effect of head position on size discrimination. *Psychonomic Science* 14 (1969): 80.

The subject sat in a chair and viewed a disk directly in front of him through an aperture, and by tilting back the chair, he could view an overhead disk. Both disks could not be viewed simultaneously. The front disk was a standard distance from the subject, the overhead disk was adjusted by the examiner according to the instructions of the subject until it appeared to be the same distance away as the standard distance of the front disk. The other phase of the experiment required the subject to adjust the distance of a target on the right rather than the overhead target. Disk size on the right of the subject was overestimated, and disk size overhead the subject was underestimated.

Part III || Perceptual-Motor
Programs

Perceptual-Motor
Programs

Tests, Programs,
and Material Sources¹

Robert E. McAdam²
Illinois State University
Normal, Illinois

Over the last few months, letters were sent to various organizations and publishing companies requesting information pertaining to tests, training programs, etc. in the area of perception and perceptual-motor development. The following list contains the title of each item, author(s), if any, the publisher or organization, a brief description of the item, and the item's cost. The list was based only on information received in reply to the original letter. If the information received had statements pertaining to norms and standardization, reliability and validity, or the item's demonstrated usefulness, this is included in the description of the item. If statements were documented or a bibliography was included, this also is noted in the item's description. Only one "representative" price is given for each item — in most cases, prices varied according to quantity, model selected, etc. A publishers' address list appears on pages 109-110.

Note: The project herein was performed pursuant to Grant No. OEG-0-9-331295-3408 (031), from the U.S. Office of Education, Department of Health, Education, and Welfare, to Dr. Maynard C. Reynolds. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Office of Education, and no official endorsement by the U.S. Office of Education should be inferred.

¹ Reprinted from A selection of tests, programs, and material sources of perceptual-motor development, in Foundations & Practices in Perceptual Motor Learning — A Quest for Understanding, pp. 140-159. (Washington, D.C.: AAHPER, 1971.)

² With permission and assistance from Susan T. Rydell, Department of Special Education, University of Minnesota.

***Active Learning: Games to Enhance Academic Abilities**

Bryant J. Cratty
Prentice-Hall, Inc.

Active Learning: Games to Enhance Academic Abilities offers learning games as part of the teaching technique in the elementary and preschool grades to improve learning coordination. Movement games help those with learning problems, aid the progress of the retarded, and permit the active, normal child to learn better.

Over 100 games are described and fully illustrated. They may be used in a variety of ways to enhance various academic skills, whether as motivation or as a central core of instruction. The games are accompanied by a paragraph explaining what kinds of children are most likely to benefit. The descriptions also include modifications for using the games with the physically handicapped.

The practical examples show the reader in the simplest terms how to add movement to teaching. The reader is guided in the choice of games and the results to expect, and is shown how activities improve coordination and memory. When imagination permits an active, rather than a passive approach, the classroom performance is made enjoyable and effective.

This book will interest all adults who work with children, especially those teachers and parents of children with learning difficulties. The games children play improve their skills and achieve a happy, productive setting.

Hardback \$6.95, paperback \$3.95

Alphabet Cards

Educational Media

Cards 2 $\frac{3}{4}$ " by 4 $\frac{1}{4}$ ", lower case upper case reverse, designed for desk work by the individual student. 26 letter cards, 3 blank, instructional sheet, each set enclosed in self-seal polyethylene envelope.

Set \$1.00

Ambco Speech Test Record

Ambco Electronics

The Ambco Speech Test Record, 1161 is now available for use with all Ambco Speech Audiometer, Model A-17, as well as for use with other audiometers.

The record is a 12", long play, 33 $\frac{1}{3}$ rpm unbreakable. One side contains Phonetically Balanced Words list and the Spondaic Words list for use in determining speech reception thresholds for both child and adult. The other side of the record lists "sound-alike" words and "fading numbers."

Record \$5.00

The Art of Seeing

Warren Schloat Productions, Inc.

The Art of Seeing is a series of six color sound filmstrips which introduces the student to the language of visual perception and expression. It teaches its lesson in a way which will erase the student's fear of fine arts and stimulate him to make his own discoveries about painting, sculpture, archi-

*These programs have been added subsequent to the publication of the original article.

texture, and other media. Filmstrips deal with how to use your eyes, lines, colors, shapes, and space.

Filmstrips, records, teacher's guide \$84.00

***Audio-Visuo Motor Training with Pattern Cards**

Edith Klasen
Peek Publications

The book outlines training methods for children with impaired learning due to neurosensory disorders in areas such as visual perception, motor control, auditory functions and lateral dominance. Chapters include: symptoms of the problem learning, brain functions and learning, maturation and training, typical development patterns, left-handedness, illustrated exercises, and a glossary of terms.

1969, 58 pp. Cost unknown

Auditory Discrimination Test

Joseph M. Wepman
Language Research Associates

This is a test for determining the auditory discrimination ability of 5-, 6-, 7-, and 8-year-old children as a method for predicting articulatory speech defects and certain remedial reading problems. It is the product of over 12 years of experimentation and in its present form has complete phonetic and phonemic balance.

Research based on the test and its relation to speech and reading problems is to be found in the literature (bibliography available upon request).

The test is produced in two equated forms (Intercorrelation, $r = .94$). This provides a useful test-retest evaluation method for checking reliability, as well as an excellent method for progressive testing during speech therapy or remedial reading.

Test manual, 50 test forms, class record \$6.00

Ayres Space Test

A. Jean Ayres
Western Psychological Services

A widely used performance test for children and adults (normative data for ages 3-10 years) with visual perception impairment. An excellent instrument for difficult cases such as incoordinated, aphasic, and neurological. Measures spatial ability, perceptual speed, and directionality or position in space in approximately 20-30 minutes.

Test materials, manual, 25 protocol booklets \$25.00

Basic Concepts Through Dance (Body Image)

Dorothy B. Carr and Arden Jervey
Educational Activities, Inc.

These dances were especially selected to develop and reinforce self-concepts in children who are mentally retarded and/or physically handicapped with neurological impairments. Children are encouraged to become

aware of the use of their whole body with appropriate movements of the head, trunk, arms, hands, legs, and feet.

1 12", 33 1/3 rpm record \$5.95

Basic Concepts Through Dance (Positions in Space)

Dorothy B. Carr and Arden Jervey
Educational Activities, Inc.

This album uses the medium of the dance to help pupils develop and improve their perceptual-motor skills. The dances selected can help pupils with an inaccurate concept of their relationship to space around them and the relationship of space to them. Pupils are encouraged to move the whole body, as well as their individual limbs in many directionality and laterality activities.

1 12", 33 1/3 rpm record \$5.95

Basic Quantity-Number Set

Educational Media

This very basic arithmetic set consists of a sturdy work-card, ceramic squares to fit on the work-card, answer number-cards (1 through 10) and an instructional sheet. To increase the task demands, the reverse of the work card is without the printed numerals so that the student must fit the appropriate number-card to the quantity shown. The set is attractively packaged in a large self-seal polyethylene envelope which can be left over the work-card for practice sessions. A small self-seal envelope is used to contain the ceramic squares and small answer number-cards.

Set \$1.50

Bender Visual Motor Gestalt Test

Lauretta Bender
The Psychological Corporation

A diagnostic and experimental technique of interest to clinicians and research workers. The subject reproduces a series of designs, his departures from the originals being interpreted in terms of the Gestalt laws of perception and organization. The American Orthopsychiatric Monograph No. 3 reports studies on children and adults. Pascal and Suttell's text gives protocols for scoring practice and case discussions. A scoring system for children's protocols is in the text by Kopplitz.

Monograph, design cards, and directions . . . \$6.00 (Sale restricted to qualified persons.)

Block Design Set

Educational Media

In this introductory training set, the student is introduced to the principles of varied configurations found in design patterns. As a basic beginning, the learner manipulates 16 wooden cubes (red, green, blue, yellow, and black) to reproduce design patterns described in the training instructions enclosed with each set.

Set \$1.95

Children's World — Holt's Early Childhood Program

Margaret Wettlaufer, Margaret Deeth, Ruth Devry, and Rae Smart
Holt, Rinehart and Winston, Inc.

Children's World is a developmental program designed to excite the natural curiosity of every young child. It is built around a core of resource materials and nine sequential interest units (pets, fall, special days, winter, home and community, spring, transportation, summer, animals) — all housed in a large colorful wooden chest.

The materials are multisensory and multipurpose — over fifty child-size components which are specifically designed for their educational value, versatility, durability, eye appeal, and safety.

The approach is conceptual-developing basic concepts in social studies, mathematics, science, language arts, music, and fine arts.

The organization is flexibility structured — building concepts at several levels of development: Manipulative, semi-abstract, abstract.

The goal is the creation of a responsive classroom atmosphere — one in which each child explores his individuality and his relationship to the world around him. . . .

Program \$297.00

Daily Sensorimotor Training Activities: A Handbook for Teachers and Parents of Pre-School and Primary Children

William T. Braley, Geraldine Konicki, and Catherine Leedy
Educational Activities, Inc.

New! This book contains daily plans for a complete school year program for increasing perceptual awareness and motor ability in young children. Many of the activities can also be done easily in the home. Comprehensive evaluations are included at the end of each week so that the teacher can check her classes' progress. Material introduced includes: body image, space and direction, balance, basic body movement, hearing discrimination, symmetrical activities, eye-hand coordination, eye-foot coordination, form perception, rhythm, large muscle, fine muscle, and games.

Book \$4.95

Detect: A Sensorimotor Approach to Visual Discrimination

Lawrence N. Gould
Science Research Associates, Inc.

This outstanding new program from SRA helps the child develop essential perceptual and cognitive skills in the early learning years that he will need throughout his schooling.

The program utilizes the tachistoscopic method of presentation, whereby the teacher, using an overhead projector, flashes an image on the screen briefly (1/25th of a second) and the student must then mark in his own workbook a symbol corresponding to the image. This exercise is beneficial to the student in many ways; he acquires needed practice in coordinating "near point" and "distant" tasks, he learns to make immediate decisions and therefore builds self-confidence, and in the discussion that follows each problem, he learns to express his reasons for his decisions.

Obviously, there's much more to *detect* than meets the eye — and much more than we can explain here. For more information about this stimulating new program for early childhood education, write today or contact your SRA Staff Associate. For preschool, kindergarten, and primary grades.

No price list received.

Developing Learning Readiness

G. N. Getman, Elmer R. Kane, Marvin R. Halgren,
and Gordon W. McKee
McGraw-Hill Book Company — Western Division

A program to develop visual, motor, and tactile skills consisting of an "introductory" program and six programs: The Magic of Movable Melvin, Practice in General Coordination, Practice in Eye-Hand Coordination (Chalkboard), Practice in Eye Movements, Practice in Recognition (Templates), and Practice in Visual Memory (Imagery). The program uses the following components: Teacher's Manual, Webster-masters, Movable Melvin (Teacher's Model and Children's Models), Targets, Space Masks, Eye Movement Charts I, II, and III, Space Sighters, Chalkboard Templates, Triple Sized Chalk, Desk Templates, Filmstrips, Walking Beam, and Tachistoscopic Flashing Device. For preschool and elementary school children.

No price list received.

Developing Perceptual-Motor Needs of Primary-Level Children

Dorothy B. Carr and Bryant J. Cratty
Educational Activities, Inc.

The Album provides a sequentially-developed training program to help pupils establish necessary perceptual-motor skills. From 3 to 11 exercises are included in each aspect of the program.

The training includes the sequential development of the following: Agility, Balance, Combination Balance and Locomotor-agility, Turning Locomotor-agility, Complex Locomotor-agility, etc.

2 12", 33 1/3 rpm records \$11.90

The Developmental Test of Visual-Motor Integration — VMI

Keith E. Beery and Norman Buktenica
Follett Educational Corporation

We now know that the functional integration of visual perception and motor behavior is necessary if children are to be better prepared for academic work.

The Developmental Test of Visual-Motor Integration is a series of 24 geometric forms that a pupil is asked to draw. Inadequate performance on the test may reflect problems in visual perception, hand control, and coordination between the two.

The forms are arranged in order of increasing difficulty. The test can be administered to children in the age range 2 to 15 years, but it is designed primarily for the pre-school and early primary grades.

Since visual-motor behavior is a composite of other behaviors, techniques for determining specific areas of difficulty are provided. Because the

goal of assessment is improved educational programming, the Administration and Scoring Manual suggests teaching techniques and other materials for use by the student.

100 tests, manual, monograph, worksheets \$70.29

The Development of Body Awareness and Position in Space

Dorothy B. Carr and Bryant J. Cratty
Educational Activities, Inc.

The album provides a researched and sequentially-developed training program to help the pupil establish an accurate awareness of his body and its position in space. From one to four exercises are included in each step. The program develops from perception of body surfaces through directionality of self and other objects.

1 12", 33 1/3 rpm record \$5.95

Development Sequences of Perceptual-Motor Tasks

Bryant J. Cratty
Educational Activities, Inc.

This practical and needed book provides a rationale for the use of motor activities for the retarded and neurologically handicapped as well as exact procedures for the evaluation and improvement of basic motor attributes. All who work with mentally retarded and/or other children who evidence mild to moderate neuromotor problems will find this book of special value.

A variety of sequences to enhance balance, body-image, agility, locomotor ability, eye-hand coordination, manual dexterity, ball skills and classroom learnings through movement are given. When necessary, the sequences are illustrated. Each chapter contains a simple evaluation test or tests to measure the needs of the child; general norms for performance of these tests are presented.

Book \$2.95

The Dubnoff School Program/1 Level 1: Sequential Perceptual-Motor Exercises

Belle Dubnoff and Irene Chambers
Teaching Resources

The Dubnoff School Program/1 Level 1 is directed at the development of fine motor control, orientation to starting and stopping points, and the inhibition of perseveration. Incentive for achievement is provided in Good Work Award sheets which are given for the completion of designated segments of each section.

One of the main objectives of the program is to establish a habit of visual orientation to the upper left hand corner of the page, which is basic to successful reading and writing. The use of color at this important position is designed to focus the child's eyes on the proper starting point. The use of red and green has been incorporated for associative purposes and to promote motor control. Each exercise has supplementary activities included as suggestions on the Instructor's Guide.

This program may be used diagnostically to help determine a child's mastery of basic perceptual-motor skills and may be used to increase ability in

areas in which a child shows deficiencies. Children without perceptual deficits will benefit from this basic pre-academic activity and those who do suffer learning disabilities will receive training to enable them to progress academically. For preschool and primary grades.

Program and guide \$14.00

The Dubnoff School Program/1 Level 2: Experiential-Perceptual-Motor Exercises

Belle Dubnoff, Irene Chambers, and Florence Schaefer
Teaching Resources

The Dubnoff School Program/1 Level 2 is designed to develop fine motor control for the mastery of directional changes and multiple strokes. This program offers advanced perceptual-motor training through the use of high interest illustrations that are related to actual experiences. These illustrated exercise sheets help the student to translate specific perceptual-motor activities — such as those encountered on the playground or in neighborhood play — into more abstract interpretations. This material thus acts as a bridge between perceptual-motor and conceptual abilities. Incentive for achievement is provided by means of Good Work Award sheets, which are given upon completion of designated segments of the program.

One of the prime objectives of Level 2 is to establish the pattern for responding to visual and auditory clues. The use of red and green color has been incorporated for associative purposes and to inhibit perseveration.

Although Level 2 is designed to follow Level 1, it is in itself a complete program. For preschool and primary grades.

Program and guide \$12.00

The Dubnoff School Program/2: Directional-Spatial-Pattern Board Exercises

Belle Dubnoff and Irene Chambers
Teaching Resources

The Dubnoff School Program/2 is designed to aid in the training of children for spatial and directional orientation as well as many other school-related and functional skills.

The exercises in this program are designed to aid in developing coordinated control of both hands simultaneously as well as firm finger grasp and awareness of finger position.

The program is introduced to the child with an Orientation Program which provides preliminary exercises in body image, directionality, sequential concepts and grasp training. The child is taught to proceed from left to right and top to bottom, which is basic to successful reading and writing.

The exercise pattern cards in the Dubnoff School Program/2 are used in conjunction with a pattern board and the child is asked to reproduce the pattern or its mirror image with colored rubber bands, first by means of superimposition and then by visual copying. The pattern cards follow a developmental progression from simple to complex designs requiring a high degree of visual discipline and visual-motor organization. The overall structure of the program allows the choice of independent student or group performance. . . . Adaptable to every age level from the preschool child to the adult, with special emphasis on children aged five to eight years.

Program and guide \$29.00

Dynamic Balancing Activities

Dorothy B. Carr and Bryant J. Cratty
Educational Activities, Inc.

New! Activities described in this album range from simple to more complex line-walking tasks. Research seems to find that in motor performance, balance is an important constituent. The material in this album is useful for training the child in both static and moving balance activities and is combined with various tasks which should heighten the child's awareness of his body image. All material has been carefully researched, sequenced and prepared. The record has clear, oral instructions with interesting musical accompaniment. Use of this album can free teachers to work more closely with children in the class. The records also may be used independently by students for practice until necessary skill development has been achieved.

2 12", 33 1/3 rpm records \$11.90

Dynamic Balancing Activities — Balance Beam Activities

Dorothy B. Carr and Bryant J. Cratty
Educational Activities, Inc.

New! The material in this album attempts to correlate balance and body-image activities. The activities are carefully sequenced from simple walking in various positions on the beam to more complex patterns in which extra stresses are placed on the beam to make greater demands on the pupil. A range of activities has been provided so that all children may be challenged with novel and complex balance activities. In addition, stimulation of pupil creativity is a unique feature of this record. To correct inappropriate visual-motor integration, important in good motor developmental programs, some of the tasks presented help a child to walk a balance beam without watching his feet.

2 12", 33 1/3 rpm records \$11.90

Engelmann Basic Concept Inventory

Siegfried Engelmann
Follett Publishing Company

It is a simple test to be given individually to young children to find out whether they understand some of the basic concepts they must know to be successful in school. It tests understanding of such basic concepts as *not* and *more than one*. It shows whether a child is familiar with conventional statements and can understand them. It shows whether he can perceive patterns.

Manual, set of cards, 100 tests \$19.32

Erie Program/1: Perceptual-Motor Teaching Materials

Daniel A. Hatton, Frank J. Pizzat, and Jerome M. Pelkowski
Teaching Resources

Erie Program/1 is a series of perceptual-motor exercises organized in a game format to increase motivation and interest.

The first of the program's three units is a series of Visual-Perceptual Exercises. As the child plays the game, he learns to distinguish certain forms, first using color as an aid, then without color, and finally with color and design as distracting elements. These exercises are designed to improve his tactile and spatial perception.

The second unit, Perceptual Bingo, is a variation on the familiar "bingo" format. Its exercises are presented in an order of increasing difficulty from form discrimination to form conceptualization. An important feature of this unit is a unique control factor permitting the instructor to allow a "win" or positive achievement for a student in need of this encouragement.

The third unit is a set of Visual-Motor Template Forms to be used as the terminal exercise series with either one of the first two units. It is designed most particularly for children who may have motor problems which interfere with the proper execution of required movements. For primary levels.

Set (for six students) and guide \$77.00

Evanston Early Identification Scale

Myril Landsman and Harry Dillard

Follett Publishing Company

The Evanston Early Identification Scale is a highly efficient device for identifying children who can be expected to have difficulty in school. The test may easily be administered to a group or an individual by the classroom teacher. Children are asked to draw the figure of a person. The drawing is scored by the teacher through the use of a 10-item, weighted scale.

The EEIS is valid for children between the ages of five years and six years three months. Except in case of mental retardation, intelligence does not significantly influence the test results. Ideally, it should be administered in the spring of the kindergarten year so that the children will be familiar with drawing materials.

100 tests, teacher's manual \$9.96

Exer-Cor Apparatus

Marietta Apparatus Company

An apparatus allowing a subject to perform various creeping exercises while remaining in place. Following a controlled creeping-program, physical and mental abilities and mental and manual skills apparently tend to improve. Exercise on this machine may lower your golf scores, raise your bowling average, and improve your reading and writing. For further information about this miraculous machine, see p. 22 of the Marietta Catalog No. 69.

Exer-Cor Apparatus \$99.50

Eye-Hand Manipulation Set

Educational Media

In this set, containing 40 wooden objects, the student is called upon to produce a fine response in eye-hand coordination. The correlation between this skill response and the ability to manipulate writing tools makes such exercises of vital importance to the young child, and of particular importance in the training of the culturally deprived or handicapped student.

Set \$2.25

Fairbanks-Robinson Program/1 Level 1: Perceptual-Motor Development
Jean S. Fairbanks and Janet I. Robinson
Teaching Resources

Fairbanks-Robinson Program/1 Level 1 presents in basic form tasks to develop those perceptual-motor abilities regarded as prerequisites to academic functioning. The tasks are designed for most effective use with a maximum of two children at a time. Full advantage should be taken of the reusable nature of many of the exercise pages, thus allowing reinforcement through repetition.

Each of the sections includes a number of large exercise sheets with attractively printed designs for tracing, coloring, matching, selecting, and cutting. In use, the sheets are placed beneath a protective acetate panel. Crayon markings are easily removed from the protector with a damp tissue or soft cloth. To develop motor ability, extensive finger tracing is used before experience with crayons.

The various sections of the program deal with line-movement exercises, shape recognition and discrimination, coloring and cutting exercises, spatial orientation, constancy of form and size, figure-ground discrimination, spatial relations, and spatial relations presented in puzzle form.

Program and guide \$79.00

Fairbanks-Robinson Program/1 Level 2: Perceptual-Motor Development
Jean S. Fairbanks and Janet I. Robinson
Teaching Resources

Fairbanks-Robinson Program/1 Level 2 covers the significant areas of perceptual-motor development in depth, making use of visual, manipulative and coordinative experiences. Although Level 2 is a continuation and advancement of Fairbanks-Robinson Program/1 Level 1, it is a complete program in and of itself.

The first of eleven sections (Section A) reinforces at a higher level the left-to-right movement, top-to-bottom progression, and rhythmic performance established in Level 1. Section C stresses the development of eye-hand coordination and dynamic hand coordination through the use of scissors. Section E deals with the ability to discriminate visually in the spatial orientation process.

Introduced in Level 2 for the first time are line and form reproduction (Section B), as distinguished from recognition and discrimination at Level 1; discriminating for similarities and differences of lines and forms (Section D); visual tracking and the imbedding of figures in figure-ground exercises (Section F); experiencing spatial concepts through three- and two-dimensional activities, reproducing color sequences, and ordering of forms by size (Sections G and H); part-whole organization (Section I); design copying (Section J); and spatial relationships involving the assembly of puzzle pieces without content clues (Section K).

Set and guide \$69.00

54 Functional Words

Warren Schloat Productions, Inc.

Fifty-four functional words use a multisensory approach — visual, kinesthetic and tactile — in teaching the functional words and signs of everyday life to your primary and special educational classes. This unique classroom-tested

series is designed especially for classes of exceptional children, but will also prove useful for all primary classes and for adult education for the foreign born. Filmstrips, flashcards, workbook, teacher's guide \$68.00

The Fitzhugh *PLUS* Program
Kathleen Fitzhugh
Allied Education Council

New-Revised — The Fitzhugh *PLUS* Program in perceptual training and language and number concepts for children with learning disabilities, limited cultural backgrounds and readiness needs. Nine individualized instruction workbooks with self-scoring plus marker. New — complete student placement guide and teacher's manual.

The Fitzhugh *PLUS* Program was developed to provide classroom materials for children with learning disabilities. The nine workbooks incorporate an effective self-teaching process for individualized learning. The Fitzhugh *PLUS* Program was designed as a supplementary curricular approach and therefore should be used in conjunction with other materials and techniques. The materials may be used as a remedial and/or preparatory program.

The program covers the following areas: shape matching, shape completion, alphabet and common nouns, action verbs, addition, subtraction and multiplication, shape analysis and sequencing, narrative problems and division, and grammar and general knowledge.

Special introductory price on examination set \$16.00

The Frostig Program for the Development of Visual Perception
Marianne Frostig and David Horne
Follett Educational Corporation

The Frostig Remediation Program: The Frostig Program for the Development of Visual Perception, in the format of worksheets divided into the five areas of training (visual-motor coordination, figure-ground, perceptual constancy, perception of position in space, perception of spatial relationships), is recommended for remedial work for children with known or suspected visual perceptual problems. Because the exercises are divided into the five areas of training (unlike the Pictures and Patterns Program), their use can be precisely geared to results of the Standardized Frostig Test, if available.

The Teacher's Guide for the Remediation Program gives complete directions for a visual perceptual program geared to specific problems. The step-by-step directions for the worksheets are given in order of difficulty for each of the five visual perceptual areas. Equally important are the directions for physical and manipulative exercises for each of the five areas.

Program box (set of 359 spirit masters and teacher's guide \$98.62

The Pictures and Patterns Program materials consist of three Student's Books (Beginning, Intermediate, and Advanced Levels), transparent overlays so students can repeat the exercises in the books, and three Teacher's Guides. Each of three Teacher's Guides gives the teacher specific directions for physical exercises, three-dimensional activities, paper-and-crayon exercises, and the procedures for carrying out the program. The page-by-page directions for the

exercises in the Student Books give the objectives of each exercise, how to present it to the children, what skills are involved, and what results may be expected.

The guides also briefly explain visual perception and the five areas with which the program is concerned, define and explain terms, and discuss common visual perceptual problems.

Program (3 student's books, 3 teacher's guides, 15 overlays) \$11.22

The Hollien Thompson Group Hearing Test
Language Research Associates

This is a new group screening test for auditory acuity. It is easily administered, scored and interpreted. It takes only a few moments to test up to 40 children at a time. It determines which children have a hearing loss and are in need of an individual hearing test. It has established reliability and validity. It is economical — costing only a few pennies per child. It is administered most often by the school nurse or other health related personnel.

Test kit, 50 forms (Introductory offer — for a limited time only!) . . . \$11.00

***Improving Motor-Perceptual Skills**

Portland Public Schools
Northwest Regional Educational Laboratory

A guide to determine whether working directly with kindergarten children to improve performance on motor-perceptual tasks would affect reading ability at the end of grades one, two, and three. Outlines activities to develop general coordination; balance; body image; eye-hand coordination and eye movements; sensory perception, and contains an appendix on term definitions, activity equipment, and teacher checklists.

1970, 124 pp. \$3.00

Integrated Development: Motor Aptitude and Intellectual Performance

A. H. Ismail and Joseph J. Gruber
Charles E. Merrill Publishing Company

Provides comprehensive evidence to define the relationship between perceptual-motor and intellectual development.

Makes a three-pronged inquiry into the mental-physical relationship. *Factor-analysis* technique provides evidence concerning the factor structure patterns of motor and intellectual variables. Assimilates this data by the *multiple regression* technique to support the hypothesis that intellectual performance can be predicted accurately from motor performance. Data and analysis further demonstrate that specific motor variables — coordination, balance and kinesthetic items — are superior indicators of intellectual proficiency. *Controlled experiments* seek to determine the specific nature of the relationship — to what degree causal, to what degree positive propensity — between motor and mental abilities.

Offers motor evaluation scaling systems which make it possible to approximate Otis I.Q. and Stanford Academic achievement ratings from motor

performance scores. Enables the teacher or counselor to evaluate a child's abilities without the possibly repressive effects of formal testing and observation.
1967, 224 pp. \$4.95

LADOCA Aids for Teaching the Mentally Retarded

Roy McGlone
LADOCA Project and Publishing Foundation, Inc.

A series of exercises using a variety of objects and materials. Each exercise is accompanied by an illustrated description of the materials, the procedure, and objectives of the exercise. (A booklet describing the materials and exercises was received.) Three kits of materials are available: Aids for Perceptual Training; Aids for Advanced Perceptual Training; and Aids for Number Perception. Developed for the mentally retarded.
Three kits \$104.25

Learning to Move and Moving to Learn, Book 1, Insects

Wanda Arbuckle, George Cornwell, and Eleanor Ball
Charles E. Merrill Publishing Company

Relates learning disabilities to a lack of perceptual-motor abilities. Provides motivation for the development of body movements with the greatest efficiency.

Provides songs with accompanying illustrated postural activities to encourage natural rhythmic body movement.
1969, 40 pp. \$3.50

Listen-Hear Books

Jan Slepian and Ann Seidler
Follett Educational Corporation

A new approach to teaching auditory discrimination. As an educator you recognize that the ability to discriminate between sounds is basic to speaking and reading ability. Auditory discrimination is an essential part of the curriculum for preschool, Head Start, kindergarten, and primary grades, especially for disadvantaged children. You will find that speech specialists Jan Slepian and Ann Seidler have provided just the materials to fill this need . . . the *Listen-Hear* Books and accompanying materials.

Junior Listen-Hear classroom package (preschool — grade 1) . . . \$22.35
Listen-Hear classroom package (Grades 1-3) . . . \$18.12

The Marianne Frostig Developmental Test of Visual Perception

Marianne Frostig, Welty Lefever, and John R. B. Whittlesey
Consulting Psychologists Press

This test yields scaled scores in five different perceptual areas, enabling the examiner to identify both strengths and handicaps. These areas are: I. Eye-Motor Coordination. II. Figure-Ground. III. Constancy of Shape. IV. Position in Space. V. Spatial Relationships.

A paper and pencil test requiring no expensive equipment, the Frostig Test may be administered to small groups as well as to individual children.

Normative data based on 2,116 normal children between the ages of 4 and 8 is reported in quarter-year intervals. Overall results may be recorded in Perceptual Quotients, which readily reveal a child's deviation from the expected perceptual development for his age level.

Examiner's kit (manual, monograph, 10 test booklets, 1 set of demonstration cards and 1 set of plastic keys) \$10.50

The Massachusetts Hearing Test

Philip W. Johnston
Massachusetts Department of Public Health

An arrangement may be easily made whereby a complete pure tone screening test can be given to 10 children at a time. The accuracy obtainable with the group test closely approaches the accuracy of individual sweep check screening tests.

Experimental work and field trials carried out over a period of the past 21 months have combined to set up definite recommendations with respect to equipment and procedure for this group screening test. The Massachusetts Department of Public Health has acquainted audiometer manufacturers with test details with the result that leading manufacturers now modify audiometers sold for school use so that they may be easily adapted for the group test.

Massachusetts Vision Test Welch Allyn, Inc.

"This equipment is an obsolete item and no longer available." (Letter from C. M. Evans, Vice-President, Welch Allyn, Inc.)

Memory-For-Designs-Test (MFD)

Frances K. Graham and Barbara S. Kendall
Psychological Test Specialists

A simple drawing test of perceptual-motor coordination, depending on immediate memory and suitable for use in the age range 8.5 to 60 years. Experience and research since 1945 have established the MFD as an extremely sensitive detector of brain injury of many types. Testing usually takes less than 10 minutes.

It is used for quick, effective differentiation of functionally-based disorders from those ordinarily associated with brain injury, in situations ranging from the classroom to the neurological clinic. Quick screening allows more appropriate use of much more expensive (in terms of time and equipment) psychological and medical examining procedures, since false positives can be almost completely eliminated. Useful wherever the tester would like to observe perceptual-motor performance in a standard situation.

Additional information pertaining to materials, procedure, scoring, standardization and norms, reliability, validity, and possibly research uses was included. Most statements were documented; reference list was included.

Tester's set \$8.50 (Orders must be accompanied by a statement of the tester's name and the qualifications of the person responsible for the test's ethical use.)

Michigan Language Program

Donald E. P. Smith, General Editor
Ann Arbor Publishers

The Michigan Language Program is a self-instructional language arts curriculum. Reading, writing, listening and speaking skills result from responses to thousands of carefully engineered tasks, perfected during a five-year period of development. They take the learner from no knowledge of reading to independent word attack. The program consists of: 1. A set of self-instruction booklets and tapes, and 2. Provision for their use in a controlled classroom environment.

The program was developed in a classroom and was found to be most effective when the teacher managed the class in particular ways. Self-instruction in classroom management techniques for the teacher is provided in the manual.

The program begins with basic visual and auditory skills, then progresses to words, sentences and paragraphs.

Systematic training is provided in the perceptual skills necessary for primer reading. Validity information was reported; some specific references were cited.

Examination kit ("Complete overview of Michigan Language Program with samples from rationales for each book.") \$25.00

Michigan Tracking Programs: Symbol Tracking

Ann Arbor Publishers

To correct a deficit in auditory memory. For use with students exhibiting poor memory for word groups, inattention, distractibility, and forgetfulness.

1-10 copies, per copy \$1.25

Michigan Tracking Programs: Visual Tracking

Ann Arbor Publishers

To correct a deficit in visual discrimination. For use with students exhibiting reversals, inversions, omissions, errors in oral reading, slow rate, and spelling problems.

1-10 copies, per copy \$1.25

Moore Eye-Hand Coordination and Color Matching Test

Joseph E. Moore

Joseph E. Moore and Associates

This test measures the speed and accuracy with which an individual can coordinate small muscle movements involving eye-hand activity, since it requires the coordination of the thumb, the index finger, and the eyes in a constantly changing spatial pattern.

The color matching portion of the test measures the speed with which a person can select and match four colors: red, green, blue, and yellow. Besides revealing the individual's speed and accuracy for color selection and placement, this test is helpful in disclosing the presence of color blindness, although not in measuring its exact nature or extent. Some validity and reliability information

was given. Norms are available for preschool-adult. (Some tables of normative data were received.)

Test \$25.00

Mosaic Design Set (Large)
Educational Media

The task challenge demands continue to increase as the student is introduced to the design patterns called for in this 80-piece instructional set. Large design problems are called for in the progressive series of patterns enclosed with this set. The material is accompanied by an instructional sheet describing the step-by-step procedures which will lead the student to eventual success in this exercise, which calls for eye-hand coordination, memory for design, and color and shape recognition and reproduction.

Large mosaic set \$2.50

Mosaic Design Set (Small)
Educational Media

In this second of the "Design for Learning" series, the student is introduced to progressive demands of more complicated patterns through the use of a 42-piece wooden mosaic set, attractively produced in varied colors. The total task demand is carefully described in step-by-step procedures for the classroom instructor to follow.

Small mosaic set \$2.25

Motor Aids to Perceptual Training — Observation Checklists
Clara M. Chaney and Newell C. Kephart
Charles E. Merrill Publishing Company

Developed for classroom teachers and teachers of special groups. Designed to help the teacher develop a 'clinical eye' for observing behavior in the child's performance on the *Purdue Perceptual-Motor Survey and Visual Achievement Forms* by Roach and Kephart.

Helps teacher to diagnose and isolate areas of difficulty and to design a suitable training program.

Contents: Observations of Basic Motor Movements. Differentiation: Head Control, Trunk Differentiation. Balance and Coordinated Differentiation: Changing Positions, Sitting, Standing, Locomotion, Walking and Running, Galloping, Gliding. Observations of Visual Motor Movements. Fixations with Reach, Grasp, and Release: Reaching, Grasping, Releasing, Pursuits.

1968, 16 pp., package of 20 \$3.00

***The Motor Facilitation Program of Public School District 21, Wheeling, Illinois**
Donna Obrecht, Editor

The primary purpose of the program is to assist individual children develop perceptual-motor abilities. Details the implementation of the program and contains activities and techniques for kindergarten students; grades 1-6, and junior high school students, together with an evaluation giving an overview of

the effect of the program. Also contains an appendix on the syllabi used, evaluation instruments, materials, and persons trained in the program.
1969, 390 pp. \$1.00

Motoric Aids to Perceptual Training

Clara M. Chaney and Newell C. Kephart
Charles E. Merrill Publishing Company

Offers basic motor and perceptual activities for training children with learning disorders, including the brain injured and retarded.

Presents theoretical basis for such training in the first section. Deals with learning problems and questions of behavior control.

Considers problems of evaluation of behavior and includes methods of observation suitable for use by both parents and teachers.

Provides complete illustrated descriptions of activities and programs for training and teaching the slow learner.

Contents: Motor-Perceptual Learning. How to Structure and Control Behavior. Procedure for Evaluation. Learning to Listen. Basic Adjustments. Differentiation and Locomotion. Ocular Motor Coordination. Speech Readiness.

1968, 128 pp. \$3.95

***A Motor Perceptual Developmental Handbook of Activities for Schools, Parents, and Pre-School Programs**

Frank A. Belgau
Perception Development Research Associates

A variety of activities (suspendable ball, walking board, jumping board, rocking board, balance board, space walk, beanbag, and group) designed to promote visual coordination as a part of total body coordination is included. This approach is built upon the premise that motor training is a necessity in the total training process because of the interrelationships between the motor and visual systems of the body. Visual perception is approached through a developmental sequence of motor activities.

1967 Cost unknown.

***Move-Grow-Learn**

Marianne Frostig
Follett Educational Corporation

The book contains 181 illustrated exercises and diagrams and is a teacher's guide for a program of teaching movement skills and developing creative movement. The program is designed to enhance the total development of young children, their physical, psychological, and learning abilities, how to get along with one another, their environmental relationships, and is planned for children from kindergarten through primary grades. Deals with movement attributes; body awareness; developing language through movement education; teaching children with learning difficulties; facilities and equipment

1969, 64 pp. \$3.96

***Movement Pattern Checklist**

Barbara B. Godfrey and Margaret M. Thompson
Kelly Press, Inc.

These checklists have been devised for evaluating a number of the basic movement patterns, e.g., walking, running, jumping, hopping, skipping, sliding, crawling, climbing, throwing, catching, hitting, kicking, pushing, pulling, etc. The checklists can be used as they are or adapted to the needs of a particular situation. They are adaptable for use on file cards (4" by 6") or on paper for insertion in a record folder. Included are a Movement Profile Sheet for summarizing the information from the checklists and a Movement Pattern Checklist (short form) for evaluating general elements and deviations of all patterns on a single sheet. Complete instructions and techniques for using the checklists are given. Evaluations based on 'pattern elements present' and 'deviations noted' should be of help to the classroom teacher, the special education teacher, the physical education teacher, the counselor, the clinician, the parent, and others involved with or interested in determination of an individual's movement pattern characteristics and problems.

1966 75¢ each, 6 copies \$4.00

***Movement, Perception and Thought**

Bryant J. Cratty
Peek Publications

The activities mentioned will benefit some children in the acquisitions of some of the operations outlined. The book attempts to delineate what type of children may be helped with these activities, most of which are based upon unsubstantiated hypotheses, rather than results of completed research. Some subjects dealt with are learning, motivation, and transfer; pattern recognition; serial memory ability; number spelling, and word games; thought and movement.

1969, 77 pp. \$2.95

New York School Vision Tester

Bausch and Lomb

Research has revealed that on the average 3 out of 10 American school children suffer from inadequate vision. That's 30 out of every 100 children handicapped to some extent in their learning ability! Most of these children are unaware of their defective vision and often do not show symptoms of faulty vision.

To identify these 3 out of 10 children, schools need a test that is easily administered and reliable. It is generally agreed that such a test must consist of more than a Snellen wall chart — that it should use acuity characters of the illiterate type, include a test for farsightedness, and permit measurement of muscle balance where desired.

The School Vision Tester meets all these requirements. It provides a highly reliable and practical method for measuring the seeing performance of each child. It is a screening device indicating those who are handicapped in their learning ability and who will benefit by a complete professional eye examination. Bibliography included.

Tester, slides, scoring key, manual \$325.00

Oseretsky Motor Proficiency Tests

Maria Irene Leita da Costa, Translator
Edgar A. Doll, Editor
American Guidance Service, Inc.

The Oseretsky Tests comprise a year by year scale of the fine and gross motor development of children. The test was conceived and executed for measurement of motor skills in the same manner as the Binet Test for Intellectual Skills. Six basic types of tasks are included for each age.

These tasks require: General static coordination, dynamic coordination of the hands, general dynamic coordination, motor speed, simultaneous voluntary movements, performance without extraneous movements. For ages 4-16.

Set of test equipment, including manual and 25 record blanks \$28.00

A Paddle of Many Uses

Roy McGlone
LADOCA Project and Publishing Foundation, Inc.

A wooden paddle on which a variety of cubes can be "flipped." This teaching device was invented by Roy McGlone and was developed at Laradon Hall (School for Exceptional Children, Denver, Colorado) where, through severe tests, it became a most valuable teaching instrument in many avenues of learning.

It offers a challenge that the child can seldom ignore. It offers an opportunity at the same time to develop a skill and pride that drives him on to other useful accomplishments.

Its more apparent value is a means of developing hand and eye coordination along with a very deep concentration both of which will become an important and permanent part of the pupil's growth.

It develops the understanding of color and forms as well as the ability to recognize quick change.

It can be so arranged as to be the first happy steps in arithmetic, spelling, and reading and yet be in the field of recreation. These steps can be regulated in length with regard to the pupil's progress.

Word recognition has been made easier by the use of pictures with their printed and written symbols set up with a scheme for matching. A booklet describing the paddle exercises was received.

Set \$8.75

Parents Home Training Guide Kit

Winter Haven Lions Research Foundation, Inc.

The procedures and the methods detailed in this manual can be used by parents to increase a young child's ability and skill to more readily handle the perceptual tasks involving contour and outline form. These procedures can also be used to reinforce the total perceptual process known as the "visual-tactual-kinesthetic," or more simply, a child's eye-hand-motor performance.

A child must learn the three basic parts having to do with form-training — the seeing (or visual) part, the tactual (or feeling) part, and the kinesthetic (or

motor) part. Comparable skill is needed in all three parts if a beginning school child is to achieve at or near his maximum potential achievement level.

Kit contains: 1. Training Manual, 2. Set of Six Form Templates, 3. Sample Scoring Sheets, 4. Construction Directions for Walking Board, Jump Board, Slant Top Desk. Kits available for children in kindergarten (ages 5-6) and in the first grades (ages 6-8).

Kit \$3.00

The Parkinson Program for Special Children

Herbert Goldstein and Edith Levitt
Follett Educational Corporation

The program consists of a reading readiness kit (for M.A. 3.6 to 4.6) and reading readiness workbooks (for M.A. 4.6 to 5.6) designed to develop visual, spatial, and auditory discrimination as well as concept formation. The program assures the teacher that the prerequisites for academic success are "covered and learned."

Program kit (including materials for 15 pupils) \$128.16

Pathway School Program/1: Eye-Hand Coordination Exercises

G. N. Getman
Teaching Resources

The Pathway School Program/1 is particularly valuable in assisting children with learning disabilities in acquiring the skills of discrimination and dexterity necessary for eye-hand coordination. The exercises in this program provide a controlled activity sequence in which the child learns to use his eyes and hands in a receiving-responding-performing unity. The program involves the postural and manipulative systems in a goal-directed activity. The exercises increase in difficulty progressively so that even the most adept child will find the program challenging.

The physical activity involved in these exercises requires the achievement of control in body posture and balance as well as fluidity of movement. The child is taught to cross the mid-line of his body without hesitation or loss of control. He must acquire skills in motor planning in order to accurately judge the amount of body movement and force necessary for each task. At the same time, he must maintain directional control for accuracy. Practice is also given in left and right directionality. Oral commands are used to strengthen the child's grasp of quantitative concepts, directionality, and to reduce perseveration.

These exercises are not games of strength, but rather of skill and soft-touch control of the direction and rhythm of the ball. When the ball is tapped correctly, the child's eyes, ears, and hands will tell him that he is hitting it well. Incorrect strokes are so obvious that the child can recognize his own error, stop, and start over — thus reducing the possibility of reinforcing incorrect performance.

The Pathway Program is designed to help in preparing a child for the more advanced perceptual-motor skills necessary for reading and writing. For kindergarten and primary levels.

Program and guide \$15.00

Perceptual Testing-Training Kit for First Grade Teachers
Winter Haven Lions Research Foundation, Inc.

Kit contains test manual, test cards, 100 scoring sheets, perceptual testing and training by Florence E. Sutphin, set of targets for group testing, and various templates of geometric forms. The purpose of the training program is to develop perceptual readiness for beginning reading through visual-motor training. Some references were included.

Kit \$14.00

First Grade Classroom Unit "A" (Regular Master Templates). Contains above materials in addition to materials for a class of 30.

Unit "A" \$47.00

First Grade Classroom Unit "B" (Plastic Translucent Master Templates). Contains above materials in addition to materials for a class of 30.

Unit "B" \$111.50

Perceptual Testing-Training Kit for Kindergarten Teachers
Winter Haven Lions Research Foundation, Inc.

Kit contains a perceptual testing and training guide for kindergarten teachers, kindergarten teacher's test manual (visual-motor forms), pads of 100 training forms, and various templates of geometric forms. The purpose of the training is to develop perceptual readiness for beginning reading through visual-motor training. Some references were included.

Kit \$16.00

Kindergarten Classroom Unit "KA" (Regular Master Templates). Contains above materials in addition to materials for class of 15.

Unit "KA" \$40.50

Kindergarten Classroom Unit "KB" (Plastic Translucent Master Templates). Contains above materials in addition to materials for class of 15.

Unit "KB" \$85.50

Perceptual Training Activities Handbook
Betty Van Witsen
Teachers College Press

This is a handbook of activities, systematically developed, empirically tested, and suitable for use by the teacher of normal or exceptional children. Nearly two hundred separate entries are given, using words and line drawings, and there is a special appendix on paper-folding (origami) with easy-to-follow directions. While major attention is given to basic visual and auditory skills, activities for developing tactile, olfactory, gustatory, and kinesthetic perception are also included.

1967, 96 pp. \$1.75

Perceptual Training in the Curriculum

George H. Early
Charles E. Merrill Publishing Company

Demonstrates how teachers can modify certain curriculum activities to combine perceptual and academic learning in the same activity.

Offers curriculum units of study and projects which provide many illustrations of the theory and principles in action. Encourages teachers to make their own creative modifications.

Contents: The Problem and an Approach. A Theory of Perceptual Development. From Theory to Remediation. Perceptual Training With Social Studies. Construction Phase. Use Phase. Perceptual Training with the Language Arts. Unit: Beginning Reading With Experience Charts. Perceptual Training in a Science Unit. A Science Unit: 'Force, Energy, and Power.' Perceptual Training in an Industrial Arts Unit. An Industrial Arts Unit: 'Small Gasoline Engines: Disassembly, Assembly Nomenclature, and Functioning.' Bibliography: Appendix: Constructing a Styrofoam Sphere.

1969, 160 pp. \$4.95 hardback, \$2.75 paperback

Pre-Tests of Vision, Hearing, and Motor Coordination

Elizabeth T. Sullivan, Willis W. Clark, and Ernest W. Tiegs
California Test Bureau

These tests are designed to help screen those who may have difficulty in responding to a group test because of defects in vision, hearing, or motor coordination. Special provisions should be made for these individuals before administering a group test. Various forms are available for kindergarten-adult levels. Sample copies of tests, keys, and manuals were received. No references were cited in the manual.

35 tests, manual, and scoring key \$2.10 (Sold only to qualified purchasers)

**A Psychoeducational Inventory of Basic Learning Abilities,
With Student Workbook**

Robert E. Valett
Fearon Publishers

For the initial evaluation of elementary and junior high school students with suspected learning disabilities. Samples educational tasks from the 53 basic learning abilities in the author's *The Remediation of Learning Disabilities*. Defines and illustrates each learning ability and gives beginning, intermediate, and advanced level tasks to test the student's performance.

Specimen \$1.00

A Psychoeducational Profile of Basic Learning Abilities

Robert E. Valett
Consulting Psychologists Press

This profile is an 8-page booklet for use by psychologists in conveniently summarizing clinical information and standardized test data in five basic ability areas: motor integration and physical development; perceptual abilities; language; social-personal adaptivity; general intellectual functioning.

The profile is not a test in itself but a useful tool for recording data from a variety of widely used tests and tasks. Age range: 2 to 14 years. Booklet contains norms for each item, a scale to profile results, and references to published tests covering the five ability areas. Ideal for communicating the psychologist's findings to parents and teachers.

Examiner's kit (manual and 10 profiles) . . . \$3.00

The Purdue Perceptual-Motor Survey

Eugene Roach and Newell C. Kephart
Charles E. Merrill Publishing Company

Constitutes the first study to develop normative data on young school children (grades 1 through 4) in regard to perceptual-motor behavior.

Makes it possible for the classroom teacher to assess perceptual-motor problems in the school setting. Also relates these problems to a remedial program of educational methods and procedures. Designed to be used with *The Slow Learner in the Classroom* by Dr. Kephart as a therapeutic prescription for training. Contents: Rationale and Development. Standardization Statistics. Administration and Scoring. Recording the Perceptual-Motor Ratings.

1966, 100 pp. \$4.95

The Rail Walking Test

Roy Heath
Trinity College, Department of Psychology, Hartford, Connecticut 06106

The Rail-Walking Test was designed to be a reliable and valid index of locomotor coordination. Ages 6-14. Adult. A summary paper was sent by the author describing materials, procedure, scoring, reliability, and validity. Additional information can be found in *American Journal of Psychology*, 1942, 55, 240-47; *Psychological Bulletin*, 1943, 40, 282-84; and *American Journal of Psychology*, 1944, 57, 482-99.

Cost unknown.

The Remediation of Learning Disabilities:

A Handbook of Psychoeducational Resource Programs

Robert E. Valett
Fearon Publishers

Fifty-three specific learning disabilities are operationally defined and grouped into six major areas of learning: Gross motor development, sensory-motor integration, perceptual-motor skills, language development, conceptual skills, and social skills. Each program includes suggested remedial activities, a sample program and four-stage worksheet, and a listing of program references, instructional materials, evaluation and diagnostic aids, and related readings. Forms are provided by which the student may be evaluated in each of the 53 learning abilities and his progress charted as the resource programs are employed.

1968, 228 pp. in loose-leaf binder \$12.00

Robbins Speech Sound Discrimination and Verbal Imagery Type Tests
Samuel D. Robbins and Rosa Seymour Robbins
Expression Company, Publishers

The use of the speech sound discrimination tests and exercises in this booklet will determine just which types of speech sounds a child who manifests a phonetic speech defect of sensory origin is unable to differentiate. It will help the child to see, hear, and feel the difference between the individual sounds which compose these groups.

The enlarged revision (1958) of this booklet contains the Verbal Imagery Type Test. Much time can be saved in correcting articulatory speech defects if the child's most vivid types of verbal imagery are known in advance. This test and instructions for the Non-Verbal Mental Imagery Type Test, also included, have been used widely in state clinics. A copy of the booklet and sample scoring sheets were received.

Booklet, 43 \$1.50

Scoring sheets for young children (pad of 50). 75¢

Scoring sheets for older children (8 page booklet). 25¢

Simple Agility Movements for Impulse Control — Pre-Tumbling Skills
Dorothy B. Carr and Bryant J. Cratty
Educational Activities, Inc.

New! This album contains instructions for relaxation training as well as instructions which may aid children to control tensions in specific parts of their body, rather than permitting a spillover of tensions in all body parts when movement in only one part is desired. From these beginnings, the instructions on the record take the children through tasks in which they are encountered to move their limbs and total bodies as slowly as they can. The instructions on the record promote body-image training as well as impulse control training — two important areas in perceptual motor development. It also provides a sound base for more complicated tumbling movements.

2 12", 33-1/3 rpm records \$11.90

The Slow Learners in the Classroom
Newell C. Kephart
Charles E. Merrill Publishing Company

Shows how to release the achievement potential of slow-learning children. Highly useful with the Purdue Perceptual-Motor Survey.

Begins by describing some of the major learning areas in the development of the pre-school child. Shows how the student lacking in basic readiness skills cannot perform a large number of school tasks and so becomes easily confused.

Continues by presenting a series of performances which offers definitive clues in identifying the slow-learning child — these performances evaluate the student's status in basic learning areas.

Concludes by drawing from methods developed by clinical experimentation in teaching pre-readiness skills. Adapts these methods for use in the classroom.

Enables the teacher to identify the slow learner early and shows how to sharpen his readiness skills.

Contents: Development and Achievement. Introduction. Skills and Abilities in Simple Tasks. Motor Bases of Achievement. The Perceptual Process. Development of Form Perception. Space Discrimination. A Perceptual Survey Rating Scale. Training Activities. Chalk-board Training. Sensory-Motor Training. Training Ocular Control. Training Form Perception.

1960, 304pp. \$6.50

Sound Discrimination Set
Educational Media

Each set consists of 3 pairs of sound cubes, alternating black and white for ease of matching. These highly functional sound cubes are an integral part of the Media program which is based upon progressive training demands in perceptual discrimination. This unit is useful as an *assessment device* to determine the child's gross ability to differentiate sounds, and as a *training device* to develop attention to sound differences.

Set \$2.75

Southern California Figure-Ground Visual Perception Test

A. Jean Ayres
Western Psychological Services

A measure of visual perception dysfunction in children from 4-11 years of age. Uses figure-ground designs of embedded objects and forms. Standardized on 1,164 boys and girls. Takes approximately 20-30 minutes.

Test materials, manual, 25 protocol booklets \$15.00

Southern California Kinesthesia and Tactile Perception Tests

A. Jean Ayres
Western Psychological Services

Measures dysfunction in somesthetic perception, without verbal responses, in children from 5-8 years of age. Standardized on 953 boys and girls. Includes subtests of kinesthesia, manual form perception, finger identification, graphesthesia, double tactile stimuli perception, and localization of tactile stimuli. Takes approximately 15-20 minutes.

Test materials, manual, 25 protocol booklets \$22.00

Southern California Motor Accuracy Test

A. Jean Ayres
Western Psychological Services

A widely used test to measure the degree of and changes in sensorimotor integration of upper extremities of individuals with nervous system dysfunction. Also assists in making diagnoses of perceptual-motor dysfunction. Norms for children from 4-8 years of age. Takes approximately 10-15 minutes.

Test materials, manual, 25 test booklets \$14.00

Southern California Perceptual-Motor Tests

A. Jean Ayres
Western Psychological Services

A just published series of six tests designed to evaluate dimensions of perceptual-motor function in children from 4-8 years of age. The six tests are: Imitation of Postures; Crossing Mid-Line of Body; Bilateral Motor Coordination; Right-Left Discrimination; Standing Balance, Eyes Open; Standing Balance, Eyes Closed. Five of the six tests require no verbal responses and only two items on the sixth test require language. Standardized on over 1,000 boys and girls. Takes approximately 29 minutes for all six tests.

25 protocol sheets, manual \$7.50

Steps to Achievement for the Slow Learner

Marylou Ebersole, Newell C. Kephart, and James B. Ebersole
Charles E. Merrill Publishing Company

Provides both theory and curriculum material for teaching the child with brain damage or learning disability.

Discusses special needs and possible behavioral characteristics of the child handicapped by brain-dysfunction in the first two chapters. Defines brain damage in terms of the nervous system in Chapter 3, carefully pointing out why no two brain-injured children are ever alike. Relates these neural aspects to learning theories in Chapter 4. Also relates the learning theories to the importance of the sensory techniques used for teaching the child.

Discusses developmental stages of learning in Chapter 5, disclosing why motor learning is basic to perceptual and then to conceptual learning. Relates motor patterns to the child's need for exploration. Relates exploration to the child's evaluation of space and time.

Emphasizes the child's need for a stable point of reference — himself — in Chapter 6. Lists arm and hand activities to help the child to better know and coordinate his extremities in Chapter 7.

Presents pre-reading, pre-writing, and pre-arithmetic activities in a step-by-step manner in concluding chapters.

1968, 224 pp. \$4.95

The 'Stycar' Hearing Tests (Revised Edition, 1968)

National Foundation for Educational Research in England and Wales

These tests, designed to obtain reliable information concerning a child's capacity to hear with comprehension in commonplace situations, consist of a series of simple clinical auditory screening tests, which, it has been found, are useful in the preliminary assessment of the everyday hearing of very young or mentally handicapped children. In the current 1968 edition of the test, many of the fragile toys have been replaced by more durable models. There has been a complete revision of the manual and the format has been improved. Photographs of babies and young children responding to the tests have been included and the pictures for use in the spoken vocabulary tests have been redrawn and printed in full color. Also, the surfaces of all printed cards have been laminated with a cellulose acetate film to facilitate cleansing.

Complete set approximately \$13.80. (To obtain this test, a Qualification Form for Tests must be filled out. Must have had specific training in the use and application of the test.)

The 'Stycar' Vision Tests (Revised Edition, 1968)

National Foundation for Educational Research in England and Wales

These tests, consisting of a series of simple clinical tests employing selected Snellen letters and a set of miniature toys, were designed to give reliable information concerning the distant and near vision of young normal children between 2 and 7 years and handicapped children of a corresponding range of mental ability. The current 1968 edition of the test includes the replacement of many of the original fragile toys by more durable models. Also, in accordance with international standards, the printed material (including all single letter tests, key cards and charts) has been carefully revised and additional smaller letters provided. A second letter chart has been added to provide an alternative distance test. Finally, the surfaces of all cards and charts have been laminated with a cellulose acetate film to facilitate cleansing.

Complete set approximately \$14.40. (To obtain this test, a Qualification Form for Tests must be filled out. Must have had specific training in the use and application of the test.)

Tactile Discrimination Set

Educational Media

In this training aid, the student manipulates four pairs of varied types of fabrics and four pairs of varied objects for matching purposes. In addition, to increase the task challenge demands, a blindfold is included for use in developing a fine degree of tactile discrimination. Useful to determine the child's abilities to differentiate objects both visually and tactually.

Set \$2.75

Titmus Vision Testers

Titmus Optical Company, Inc.

The Titmus Vision Tester provides methods by which a competent technician can obtain precise and usable information on basic visual functions with the use of minimum floor space, plus savings in time and effort. The General Testing Model incorporates test slides which are usable for a variety of specific purposes.

The Titmus Vision Tester (General Testing Model) provides an excellent method for vision screening programs where a spread of age groups exists. Specific tests for each purpose are available at a turn of the dial. Predetermined standards of pass or fail are set at the local level by those who have the responsibility of referrals and corrections of anomalies. (Information on other vision tester models was also received.)

The Titmus Vision Testers, listed as various models such as General Testing, Pediatric, etc., are identical instruments. The model is determined by the slides placed within the instrument and the accessories which accompany it.

If your work deals with preschool, underprivileged or retarded children as well as others, we suggest that you consider the General Testing Unit as a desirable combination.

Tests provided for use in our Titmus Vision Tester are valid and reliable.

General testing unit, manual control, with slides and accessories for preschool, elementary, and older levels \$426.15.

Try. Experiences for Young Children

George Manolakes, Robert Weltman, Marie Jepson Scian,
and Louise E. Waldo
Noble and Noble, Publishers, Inc.

Try is a program of sequential experiences — learning experiences — that encourage the child to inquire, to explore, to better understand and relate to the world around him.

The program develops visual-motor skills and oral language, and provides individualized activities and an organized sequence of experiences.

As the child moves progressively from simple to more complex levels within each task and from task to task, certain elements remain common to the entire program. Through these, the child is able to progress with increasing independence, leaving the teacher free to work with individual children as they need her. All Visual-Perceptual Experiences encourage the development of left-to-right and top-to-bottom orientation. All Visual-Perceptual Experiences use a matching-to-sample technique which meaningfully reinforces the child's visual perception through familiar hand movements. All Related Expressive Experiences provide simple picture cues which enable the child to proceed independently of teacher direction. All Visual-Perceptual Experiences are coded so that the teacher will know immediately whether it is a new experience, a reinforcement page, or a critical checkpoint. Recommended for children ages 4-7.

Kit, including all manipulative materials (one kit is recommended for every five pupils). \$20.00

Valett Developmental Survey of Basic Learning Abilities

Robert E. Valett
Consulting Psychologists Press

The Valett Survey is designed for use by teachers, educational therapists, pediatricians, remedial tutors, or school psychologists to evaluate the developmental status of children between the ages of 2 and 7. The Survey contains 233 easily-administered tasks covering seven areas: Motor Integration and Physical Development, Tactile Discrimination, Auditory Discrimination, Language Discrimination, Language Development and Verbal Fluency, Conceptual Development.

It is not necessary to administer all 233 items — the user may select those most appropriate to the child's developmental level. Results may be used to determine whether referral for a complete diagnostic evaluation is indicated and to plan a tentative educational program for the child.

Specimen set (manual, workbook, and scoring booklet) \$1.99

Varied Shapes and Forms Set
Educational Media

A sequential training program is established through the introduction of varied shapes and forms. In this training aid, 51 wooden objects (red, blue, green, yellow, and black) allow the student to develop hand-eye discrimination and coordination as he is called upon to respond to the details of design reproduction, as described in the teacher guide which is enclosed with the unit.

Set \$2.25

Visual Experiences for Creative Growth

Millard H. Black, Elsie Benson Black, Newton S. Metfessel,
and Earl Theisen
Charles E. Merrill Publishing Company

Before a child can understand and apply the abstract concepts involved in reading, writing, and counting, he must have developed certain motor-perceptual skills, grasped spatial and temporal relationships, learned to make accurate auditory and visual discriminations, and achieved a degree of oral language competency.

These study prints help pupils develop those skills which research has found to be directly related to success in reading and general school achievement.

The series consists of 60 study prints and lesson plans (six units of 10 photographs and lessons plus an introduction for each unit).

The lessons in Units I and II are related to the development of motor-perceptual skills, a prerequisite of effective learning. Social-emotional concepts which are the bases for the contents of Units III and IV are also related to the effectiveness with which young children learn. The concepts and language skills developed through the materials in Units V and VI will help the pupil to understand, communicate, and participate all through school.

Complete set of all six units \$70.00

Visual Perception Filmstrips

Sidney Groffman
Classroom Materials Company

A structure visual training program with filmstrips dealing with Visual Discrimination and Spatial Orientation, Visual Matching, Visual Constancy, Visual Motor (Form) Coordination, Visual Memory, Figure-Ground, and Visualization. A copy of the *Manual of Instructions for Classroom Use* was received. The manual includes general instructions, techniques of response, teaching guides, scripts, and answer sheets for each filmstrip.

No prices listed.

Visual Perception Skills — Primary

Educational Activities, Inc.

Visual perception has been shown to be the single most important factor in promoting reading achievement. This series is designed to aid in the development of basic visual skills. While structured exercises dealing with several aspects are presented in each filmstrip, one particular area of visual development is stressed in each. Visual memory, visual motor coordination, visual constancy, visual discrimination, visualization, figure-ground perception, visual matching.

7 color filmstrips \$49.00

Weight Discrimination Set
Educational Media

In this Media set, the student is introduced to differences in weight through the use of three pairs of plastic containers containing different weight capacities. The weight cubes are 3 each of black and white to allow for self-operating and self-correcting. Useful as an *assessment device* to determine basic kinesthetic awareness, and as a *training device* to develop attention to details of difference.

Set \$2.75

Address List

Allied Education Council
Distribution Center
Box 78
Gallen, Mich. 49113

Ambco Electronics
1222 W. Washington Blvd.
Los Angeles, Calif. 90007

American Guidance Service, Inc.
Publishers Building
Circle Pines, Minn. 55014

Ann Arbor Publishers
Campus Village Arcade
611 Church St.
Ann Arbor, Mich. 48104

Bausch and Lomb
Rochester, N. Y. 14602

California Test Bureau
2702 Monroe St.
Madison, Wisc. 53711

Classroom Materials Company
93 Myrtle Dr.
Great Neck, N. Y.

Consulting Psychologists Press
577 College Ave.
Palo Alto, Calif. 94306

Education Activities, Inc.
P. O. Box 392
Freeport, N. Y. 11520

Educational Media
Remediation Associates, Inc.
Box 2067
Van Nuys, Calif. 91404

Expression Company, Publishers
P. O. Box 11
Magnolia, Mass. 01930

Fearon Publishers
6 Davis Dr.
Belmont, Calif. 94002

Follett Educational Corporation
P. O. Box 5705
Chicago, Ill. 60680

Follett Publishing Company
1010 W. Washington Blvd.
Chicago, Ill. 60607

Holt, Rinehart and Winston, Inc.
Box 3323
Grand Central Station
New York, N. Y. 10017

Kelly Press, Inc.
c/o Barbara B. Godfrey and
Margaret M. Thompson
University of Missouri
709 Missouri Ave.
Columbia, Mo. 65201

LADOCA Project and Publishing
Foundation, Inc.
E. 51st Ave. & Lincoln St.
Denver, Colo. 80216

Language Research Associates
300 N. State St.
Chicago, Ill. 60610

Marietta Apparatus Company
118 Maple St.
Marietta, Ohio 45750

Massachusetts Department of
Public Health
Division of Maternal and
Child Health Services
88 Broad St.
Boston, Mass. 02110

McGraw-Hill Book Company —
Western Division
Manchester Rd.
Manchester, Mo. 63011

Charles E. Merrill Publishing
Company
1300 Alum Creek Dr.
Columbus, Ohio 43216

Joseph E. Moore and Associates
4406 Jett Rd., N.W.
Atlanta, Ga. 30327

National Foundation for
Educational Research in
England and Wales
The Mere, Upton Park
Slough, Bucks, England

Perception Development
Research Associates
111 N. 12th St.
LaPorte, Texas 77571

Portland Public Schools
c/o Division of Continuing
Education
Oregon State System of
Higher Education
Waldo Hall 100
Corvallis, Ore. 97331

Prentice-Hall, Inc.
Englewood Cliffs, N.Y. 07632

The Psychological Corporation
304 E. 45th St.
New York, N.Y. 10017

Psychological Test Specialists
Box 1441
Missoula, Mont. 59801

Public School District 21
Wheeling, Ill. 60090

Science Research Associates, Inc.
259 E. Erie St.
Chicago, Ill. 60611

Teaching Resources
100 Boylston St.
Boston, Mass. 02116

Warren Schloat Productions, Inc.
Pleasantville, N.Y. 10570

Welch Allyn, Inc.
Skaneateles Falls, N.Y. 13153

Western Psychological Services
Division of Manson Western
Corporation
12031 Wilshire Blvd.
Los Angeles, Calif. 90025

Winter Haven Lions Research
Foundation, Inc.
P.O. Box 111
Winter Haven, Fla. 33880

Perceptual-Motor Programs || Assessment Instruments¹

Robert E. McAdam

Name of Instrument	General Description	Age Level	No. of Items	Need of Equipment	Administrative Ease	Source of Instrument
<i>Dayton Sensory Motor Awareness Survey</i>	15 simple items include body image, space direction, rhythm, balance, and various kinds of coordination and form perception.	4-5 yrs.	15 simple items	Special board, 8-ft. line, newspaper, watch, table, stick	Classroom teachers may learn to administer individually. Approximately 12 min. per student	William Bailey Dayton Public Schools 348 W. 1st St. Dayton, Ohio
<i>Denver Developmental Screening Test</i>	In 4 categories (gross motor, fine motor, language, and personal-social), child is tested on a number of specifics. The percentage of failing each item for a given age span is indicated.	1 mo. thru 6 yrs.	Multi-item in 4 basic categories	Special equipment for many items	Specialist should administer individually. Approximately 30 minutes	Joseph Dodds University of Denver Child Study Center Denver Colo.
<i>Developmental Profile (Doman Delacato)</i>	Observations on six categories of brain function in seven stages given a "neurological age."	Birth - 96 mos.	3 expressive 3 receptive	Very little equipment needed	Specialist (non-teacher)	Jerome Hellmuth Learning Disabilities, vol. 2. Seattle: Special Child Publications, 1966.
<i>Frustig Developmental Test of Visual Perception</i>	Test for independent development of 5 visual perceptual abilities and suggests relative need for visual training.	2 1/2 - 7 1/4 yrs.	5 visual perceptual abilities	Very little equipment needed	Teacher may administer test individually administered	Virginia D. Home The Frustig Papers for Development of Visual Perception. Chicago: Follett Publishing Co., 1964.
<i>Minnesota Physical Performance Readiness Test</i>	Hand-eye coordination, balance, agility, accuracy of body placement, forward, sideward and backward.	5 - 7 yrs.	5 items	Watch, small balls, blocks, taped areas on floor	Classroom teacher Best in groups of 3 or 4 students Approximately 5 min. per person	Harold Steby Groveland Schools 3325 Groveland School Rd., Minnetonka, Minn.
<i>Perceptual Motor Pacing Scale</i>	Tasks designed to permit observation of child's perceptual-motor skills. Through the tests preliminary selection of training methods can be indicated.	6 - 9 yrs.	11 items	Very little needed. Balance beam (6 ft. x 4 in.) mat, pillow & blackboard	Classroom or specialist teacher may administer. Individually administered	Newell C. Kephart <i>The Slow Learner in the Classroom</i> . Columbus, Ohio: Charles E. Merrill Books, 1956.
<i>Pontiac Kindergarten Perceptual Motor Screening Test</i>	Six items consisting of balance, jumping, skipping, and refined muscle coordination.	4 - 6 yrs.	6 simple items	Balance beam (6 ft. x 4 in.) mat, pillow	Classroom teacher may administer. Approximately 5 min. per pupil	Lee Haslinger Pontiac School District 300 West Park Dr. East Pontiac, Mich.
<i>Project Genesis Perceptual Motor Screening</i>	Judgment on quality of general performance	5 - 7 yrs.	28 simple items	Ball, target	Approximately 15 min.	Dorothy Jens Lakeview Public Schools 25901 Jefferson St. St. Clair Shores, Mich.

¹ Adapted from *Perceptual-motor assessment instruments, in Foundations & Practices in Perceptual Motor Learning -- A Quest for Understanding*, pp. 44-54. (Washington, D.C.: AAHPER, 1971) (Stock No. 245-25120).

Perceptual-Motor Programs || Films (16mm)¹

Jack Capon
 Supervisor of Physical Education
 Alameda Unified School District
 Alameda, California

Film Title	Brief Description	Audience Designed for	Name and Address of Producer	Color or B/W	Run. Time	Cost
<i>And So They Move</i>	Practical and meaningful experiences for physically handicapped children are presented with narration stressing the theoretical value of the activities.	Teachers Students Parents	Audio-Visual Center, Michigan State Univ., East Lansing, Mich. 48824	B/W	20 min.	Unknown
<i>Anyone Can (1968)</i>	Shows rope, ball handling, stegel, and trampoline activities designed for the educationally handicapped child.	Teachers Parents Students	Bradley Wright Films 309 N. Duane, San Gabriel, Calif. 91775	Color	27 min.	\$240
<i>Bridges to Learning (1970)</i>	Illustrates the organization and administration of a K-6 physical education program with emphasis on perceptual training and innovative curriculum.	Teachers Admin. Students Parents	Palmer Films, Inc. 611 Howard St., San Francisco, Calif.	Color	30 min.	\$250
<i>Creative Body Movements (1969)</i>	Shows how children can express themselves through movement using a perceptual-motor and problem solving approach (primary grade level).	Teachers Children	Martin Moyer Productions 900 Federal Ave. E., Seattle, Wash. 98102	Color	11 min.	\$125

<i>Developmental Physical Education</i>	Demonstrates a sequential perceptual-motor and physical fitness program for special education children in a public school setting.	Teachers Parents Students	Louis Bowers Simensen & Johnson, Ed. Consultants, P. O. Box 34, College Park, Md. 20740	Color	28 min.	Unknown
<i>Discovering Rhythm</i> (1968)	Demonstrates to children that rhythm is an outgrowth of normal activities such as walking, running, etc. Child is taught basic concepts relating to rhythm.	Children Teachers	Universal Education & Visual Arts 221 Park Ave. S., New York, N.Y. 10003	Color	11 min.	\$120
<i>Innovations in Elementary Physical Education</i> (1969)	Depicts a wide variety of movement activities and equipment designed for use in the K-6 grade programs.	Teachers Students	Crown Films, W. 503 Indiana Ave., Box 890 Spokane, Wash. 99210	Color	30 min.	\$229
<i>Just For The Fun Of It</i>	Presents activities for mentally handicapped that can be accomplished using ropes, hoops, balance beams, etc.	Teachers Children	Orange County Office of Education Educational Media Center, Civic Center Dr., Santa Ana, Calif. 92701	Color	20 min.	Unknown
<i>Learning Through Movement</i> (1966)	Children from K-6 grade levels are shown responding to verbal and rhythmic cues. Creative expression is brought out.	Teachers Children	S & L Film Productions 5126 Hartwick St., Los Angeles, Calif. 90041	B/W	32 min.	\$165
<i>Movement Exploration</i> (1967)	Includes a wide range of movement activities for K-6 grade children with an emphasis on involvement of each child in a problem solving approach.	Teachers Children	Documentary Films 3217 Trout Gulch Rd., Aptos, Calif. 95003	Color	20 min.	\$185
<i>Movement Exploration: What Am I?</i> (1968)	Children are shown how they can use their bodies to move in many different ways (K-primary).	Children Teachers	Film Assoc. 11559 Santa Monica Blvd., Los Angeles, Calif. 90025	Color	11 min.	\$125

¹ Reprinted from Bibliography of films (16mm) with perceptual-motor implications, in Foundations & Practices in Perceptual Motor Learning - A Quest for Understanding, pp. 138-139. (Washington, D.C.: AAPER, 1971) (Stock No. 245-25120).

Films (16mm) Continued

Film Title	Brief Description	Audience Designed for	Name and Address of Producer	Color or B/W	Run. Time	Cost
<i>Motogenic Curriculum</i>	Presents Dr. Barsch's special curriculum for the educationally handicapped. A wide range of perceptual-motor activities is shown.	Teachers Students Parents	University of Wisconsin Bureau of A/V Instruction, University Extension, 1312 W. Johnson, Madison, Wisc. 53701	B/W	30 min.	Unknown
<i>Moving Is Learning</i>	Demonstrates methods of assisting perceptually handicapped children through perceptual-motor retraining techniques at a visual learning center.	Teachers Parents	Canadian Assoc. for Children with Learning Disabilities, Suite 322, 88 Eglinton Ave., E., Toronto 315, Ontario Canada	Color	18 min.	\$175
<i>Perc! Pop! Sprink!</i> (1969)	Provides a series of visual experiences for children to perceive and then to interpret motorically (primary grade level).	Teachers Children	Martin Moyer Productions 900 Federal Ave. E., Seattle, Wash. 98102	Color	11 min.	\$125
<i>Perceptual Development Workshop</i>	Describes workshop activities conducted for teachers.	Teachers	Board of Education, Admin. Annex, Bldg. S-501, 6th St. N., Palm Beach, Fla. 33401	B/W	45 min.	Unknown
<i>Physical Education -- Level to Learning</i> (1969)	Educable mentally retarded children in a public school special education program are shown taking part in a vigorous and varied program emphasizing development of motor skills and fitness. Use of inexpensive equipment is demonstrated.	Teachers Parents Students	Stuart Finley, Inc., 3428 Mansfield Rd., Falls Church, Va. 22041	Color	20 min.	\$200

<i>Sensorimotor Training</i> (1968)	Describes philosophy and training methods for helping preschool children develop sensory skills and physical coordination (Dayton Public Schools Program).	Teachers Parents Students	Valdhere Films 3060 Valleywood Dr., Kettering, Ohio	Color	24 min.	\$135
<i>Thinking-Moving-Learning</i> (1970)	Shows perceptual-motor and movement activities for K-primary level children.	Teachers Specialists Students Children	Bradley Wright Films 309 N. Duane, San Gabriel, Calif. 91775	Color	20 min.	\$210
<i>Visual Perception and Failure to Learn</i>	Illustrates the effect of a disability in visual perception upon learning. Disabilities are identified and explained using Frostig Visual Perception Tests.	Teachers Parents Specialists	Churchill Films 662 N. Robertson Blvd., Los Angeles, Calif. 90069	Color	20 min.	\$150
<i>Why Billie Couldn't Learn</i> (1967)	Focuses on the diagnosis and teaching techniques used in a special classroom for neurologically handicapped children.	Teachers Parents	Calif. Assoc. for Neurologically Handicapped Children, Film Div., P.O. Box 604, Main Office, Los Angeles, Calif. 90053	Color	40 min.	\$250

Books

APPROACHES TO PERCEPTUAL-MOTOR EXPERIENCES

An overview of programs relating perceptual-motor experiences to movement education, motor abilities, reading readiness, and the problem child. Reprinted from JOHPER. 1970. 24 pp. (245-25102) 50¢

FOUNDATIONS AND PRACTICES IN PERCEPTUAL-MOTOR LEARNING: A QUEST FOR UNDERSTANDING

A multidisciplinary examination of major conceptual viewpoints of perceptual-motor behavior and teaching methods, from the Oct. 1970 Cincinnati conference. Includes descriptions of action programs, tests, resource materials, and a professional preparation survey. 1971. 200 pp. (245-25120) \$3.95

MOTOR ACTIVITY FOR EARLY CHILDHOOD*

Articles and film list dealing with motor activity for children ages 3-8. Reprinted from AAHPER publications. 1971. 16 pp. (245-25152) 50¢

PERCEPTUAL-MOTOR FOUNDATIONS: A MULTIDISCIPLINARY CONCERN

Describes action programs for developing sensory and motor skills, personalizing early education, and providing developmental activities. 1969. 160 pp. (245-08042) \$3.00

Periodicals

The following periodicals feature articles regularly on perceptual-motor development topics.

JOURNAL OF HEALTH, PHYSICAL EDUCATION, RECREATION (JOHPER)

For the school staff in physical education, dance, recreation, health education, sports, and outdoor education — featuring articles on current issues, new teaching ideas, pilot studies, curriculum development; news on latest equipment, facilities, books, audiovisual aids; and special features on timely topics. Nine annual issues (September thru June).

RESEARCH QUARTERLY

Reports new and original studies in the fields of health and safety education, dance, athletics, physical education, and recreation. Over 120 research studies annually, including such topics as physical performance, attitude studies, growth factors, motor skills and teaching techniques. Four annual issues (March, May, October, December).